March 1980

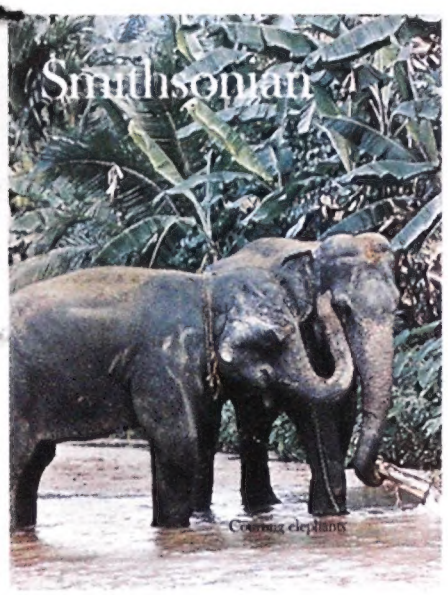
Smithsonian

Tenth Anniversary—120 Covers

(see p. 28)

1

Turn over and fold out



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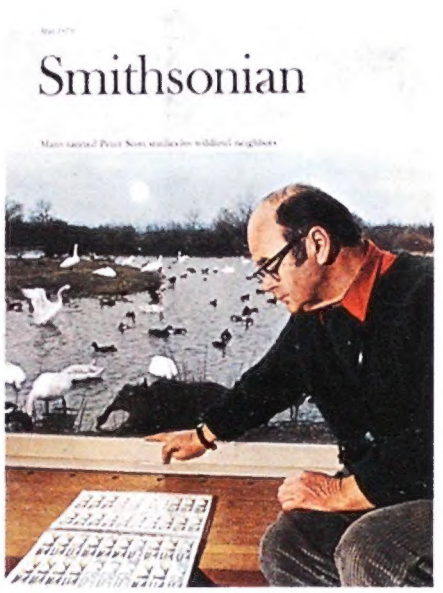

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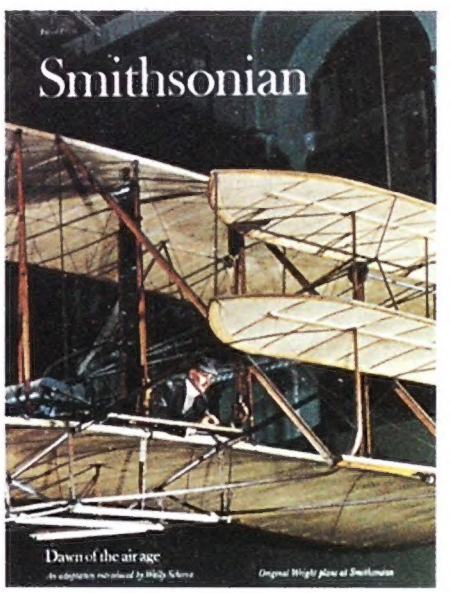

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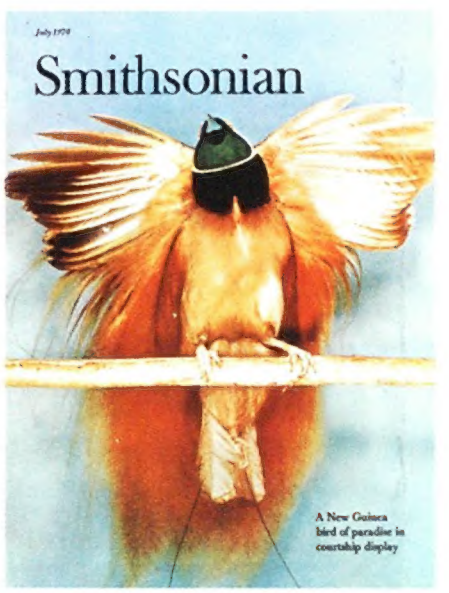

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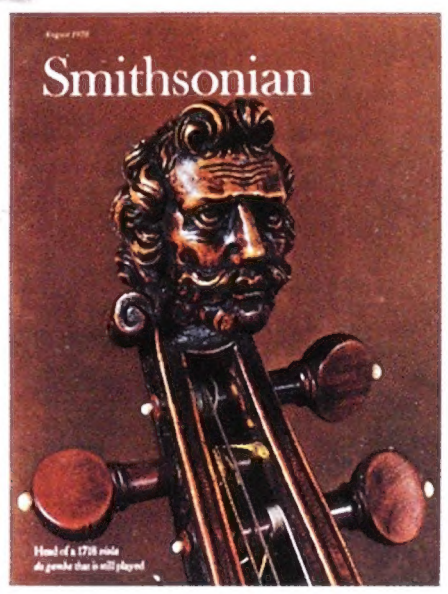

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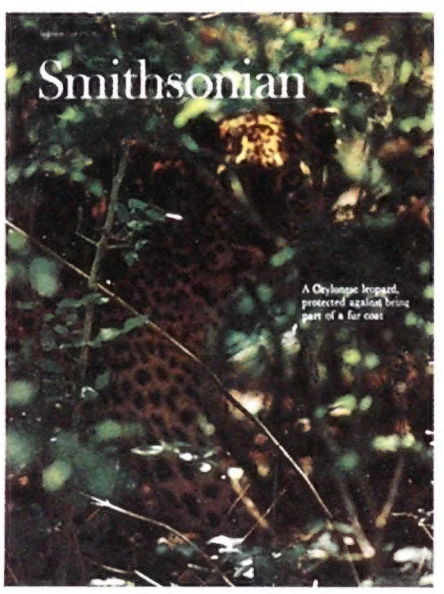

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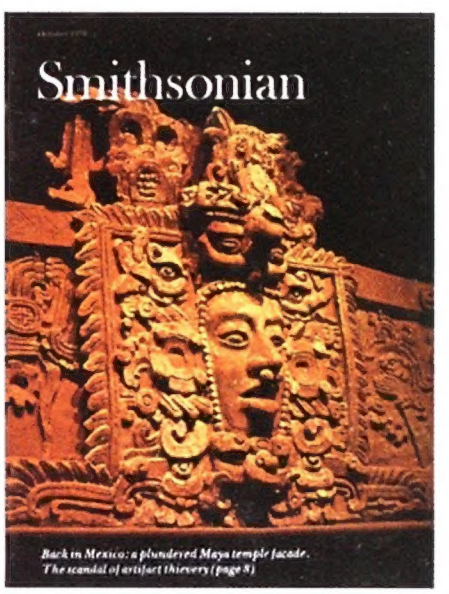

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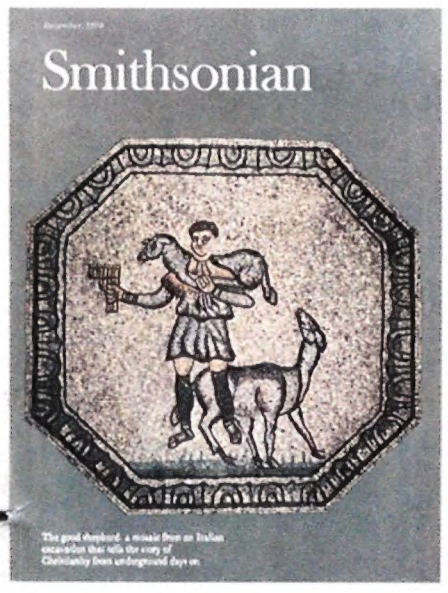

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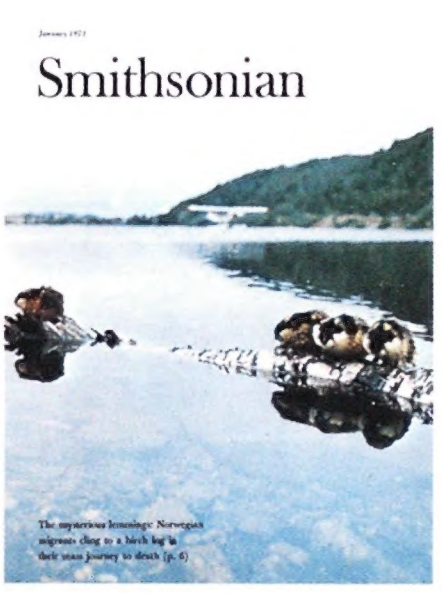

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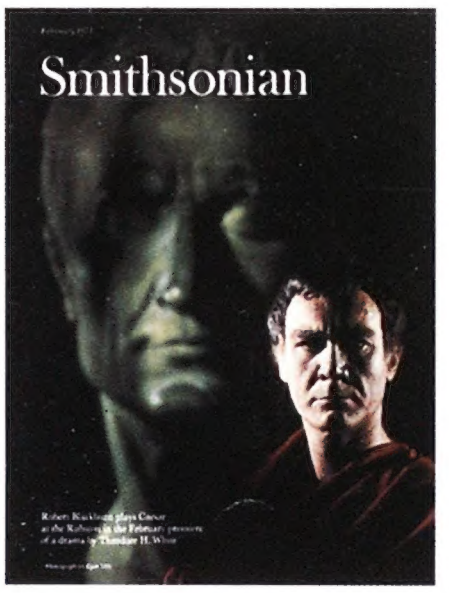

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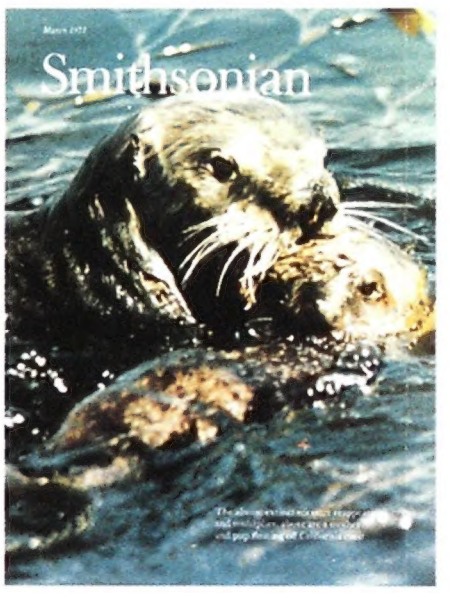

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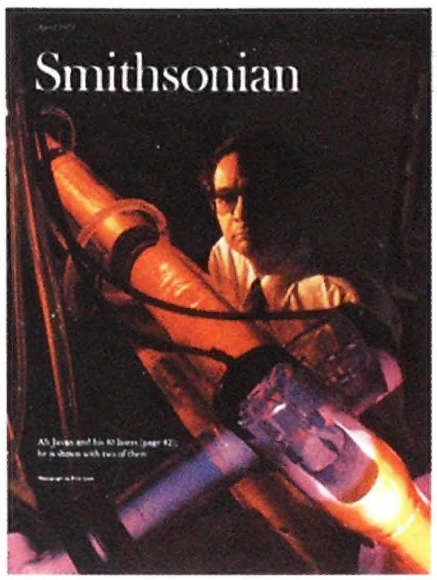

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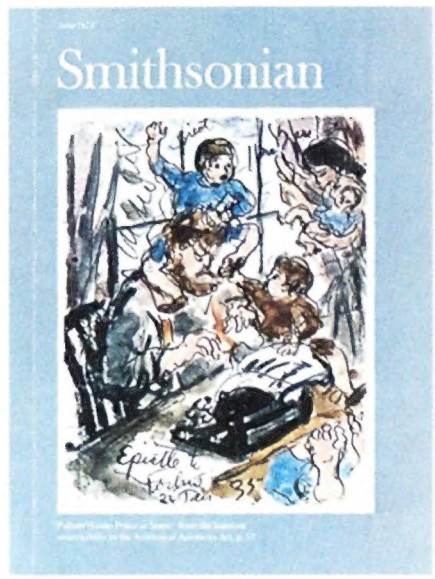

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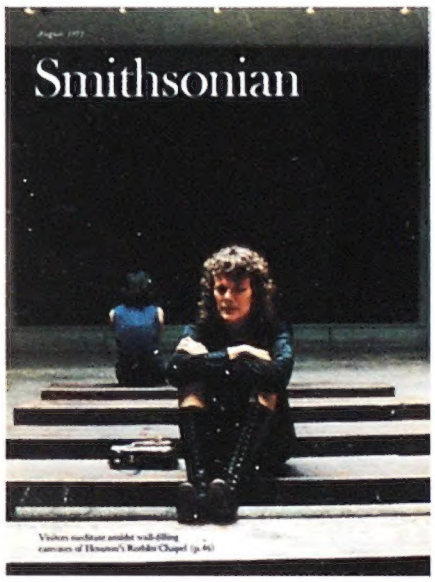

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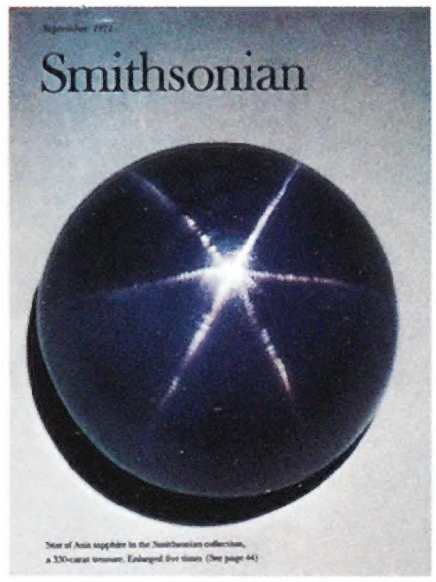

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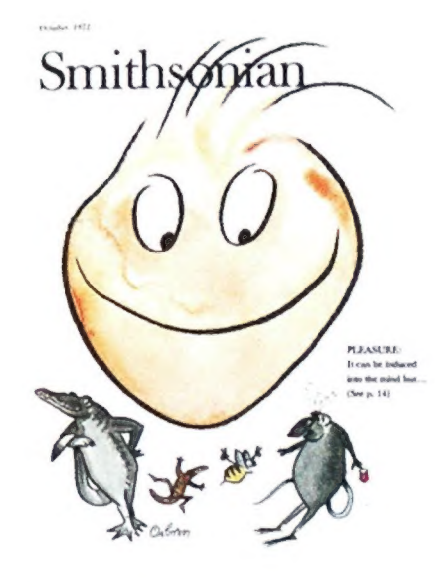

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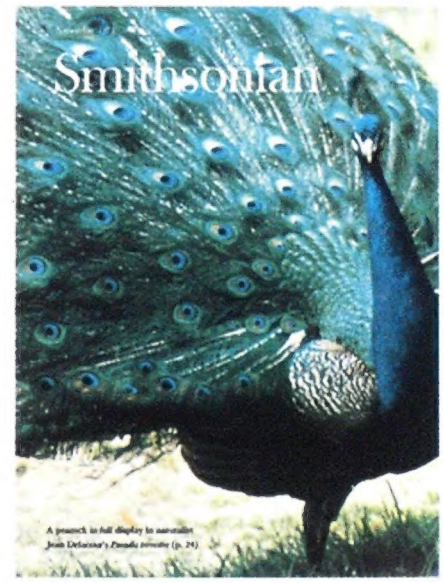

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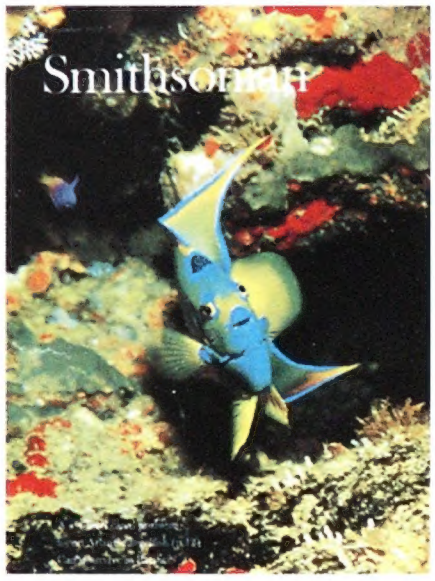

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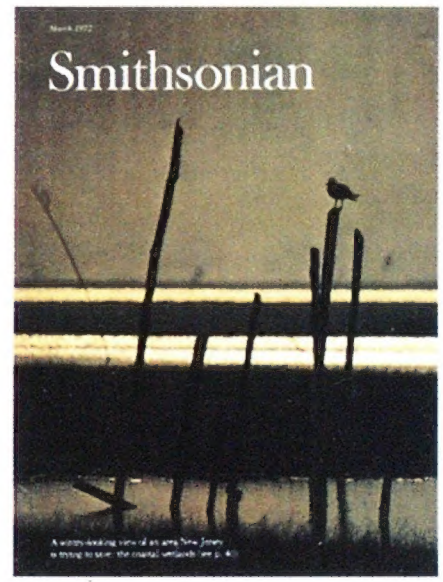

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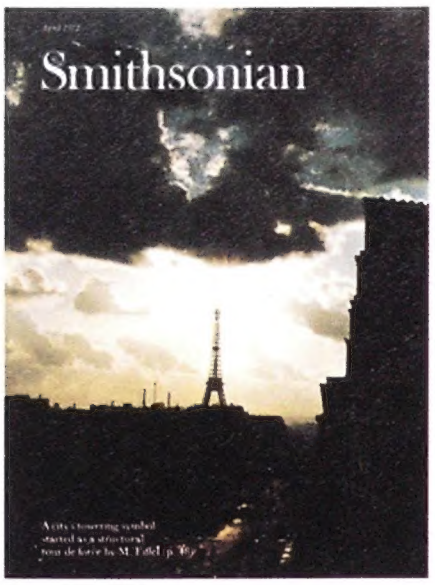

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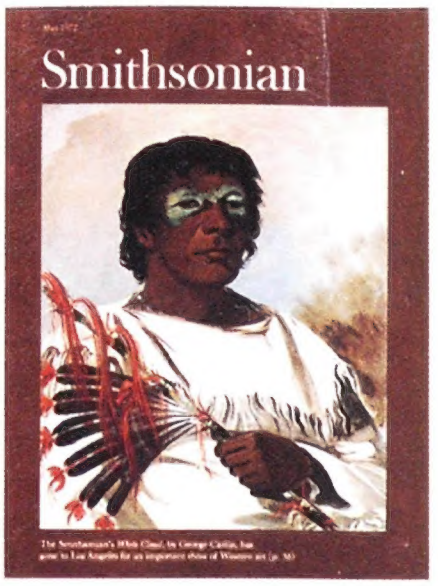

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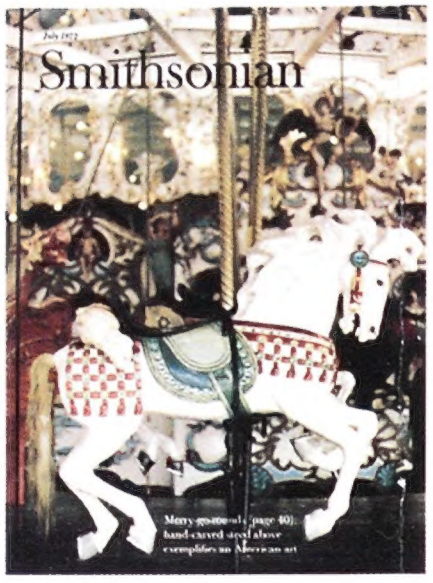

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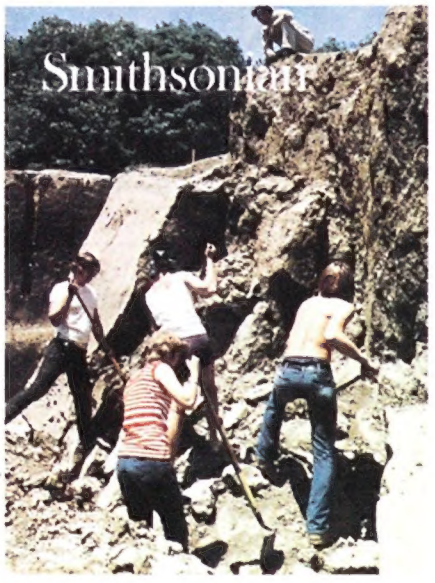

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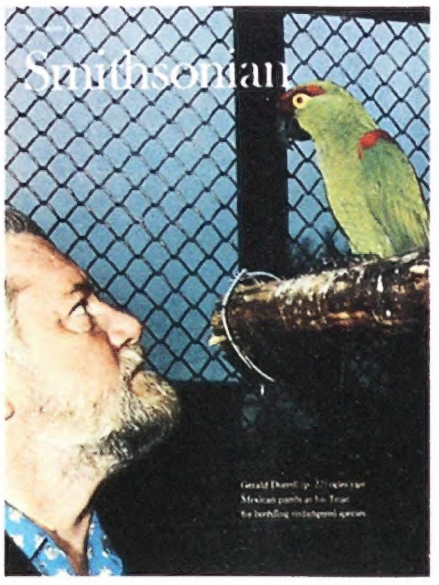

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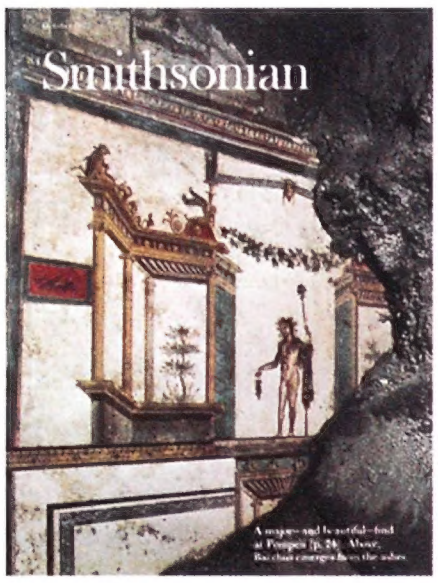

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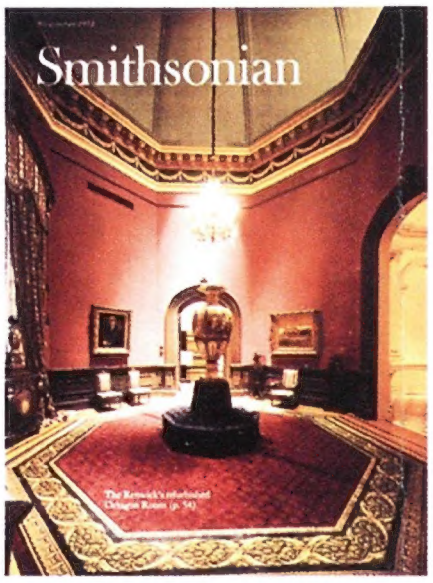

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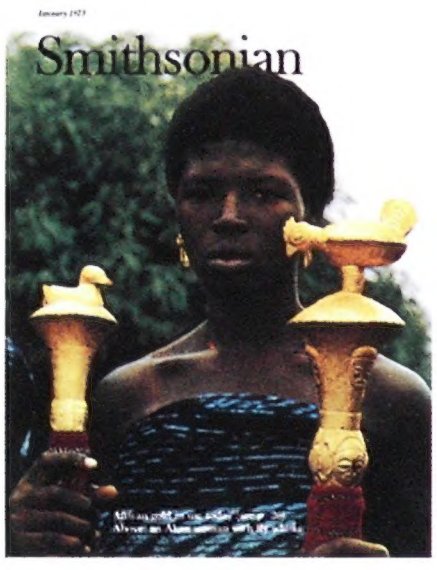

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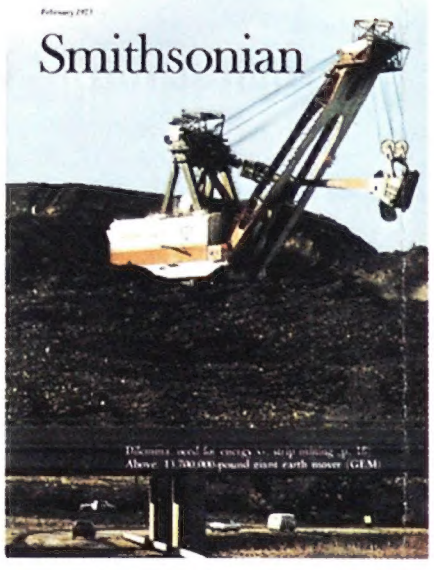

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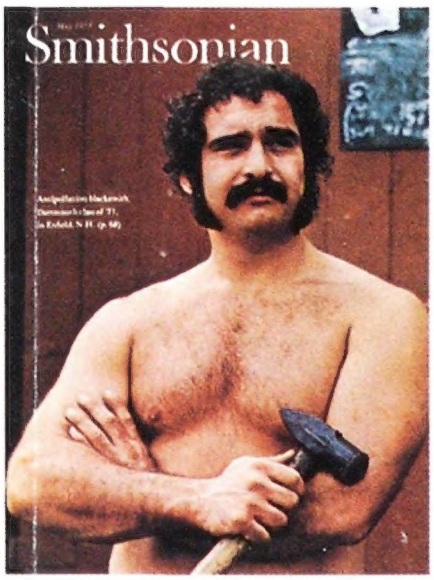

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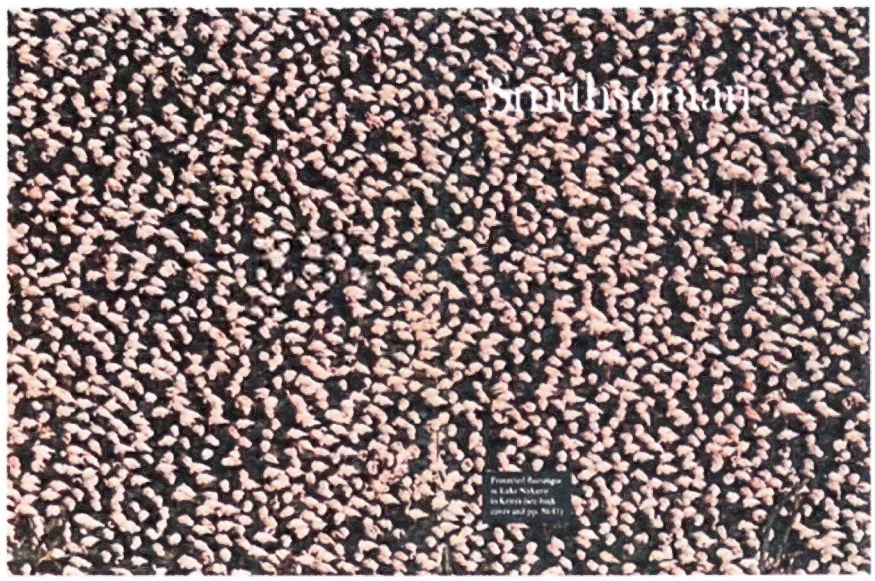

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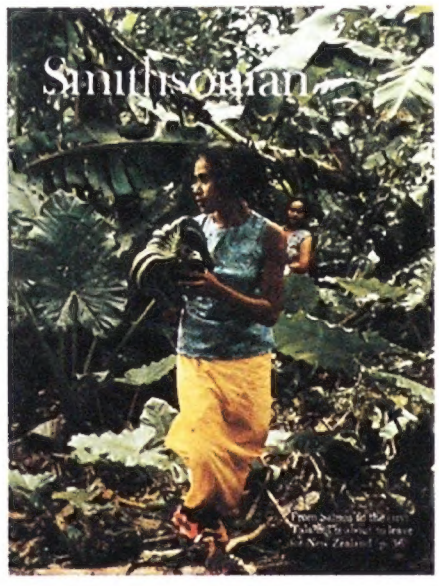

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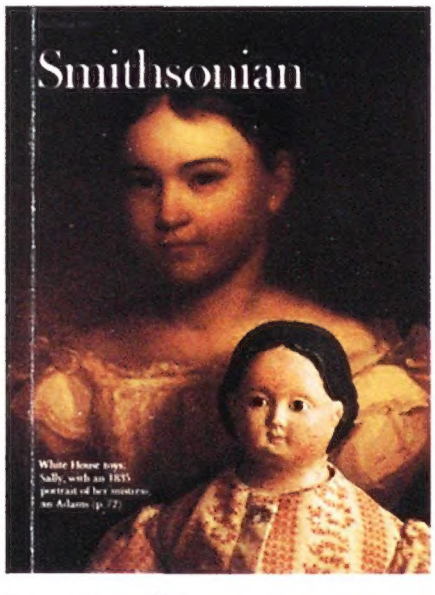

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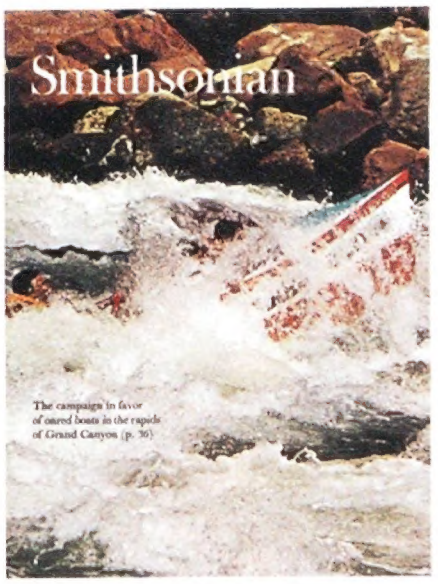

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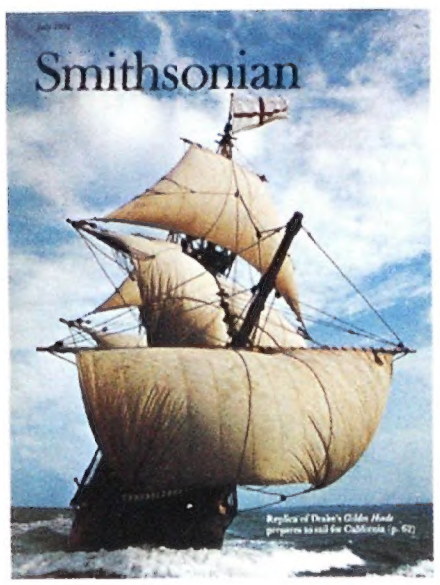

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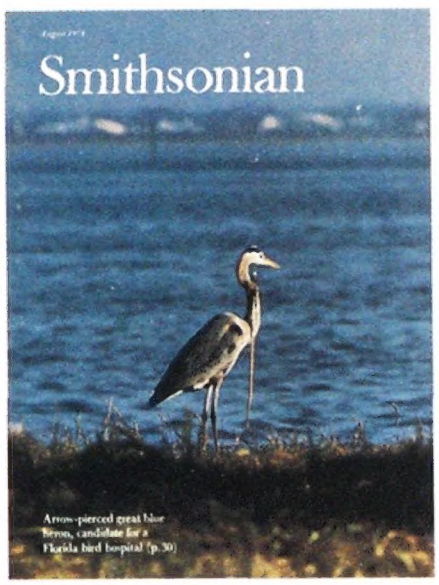

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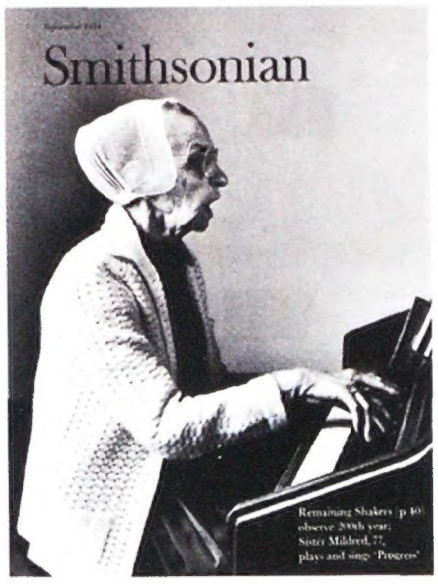

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Smithsonian
Twilight view of the Smithsonian's newest addition, the Hirshhorn Museum and Sculpture Garden (back cover and p. 34)

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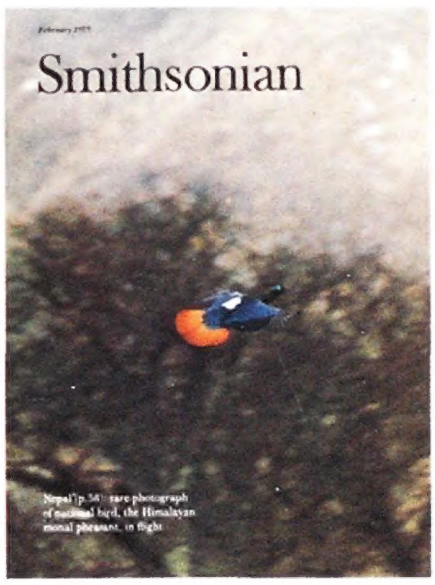

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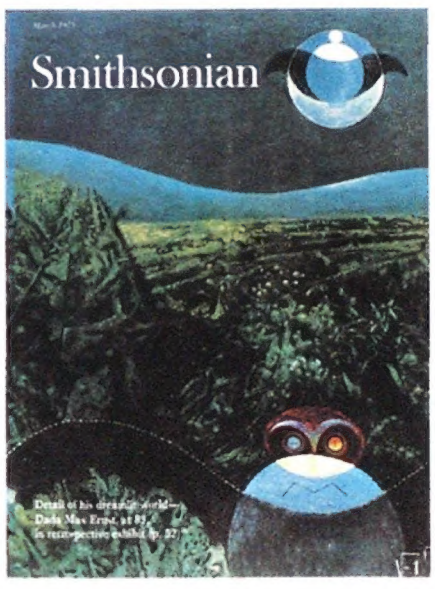

March 1975

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At its heart is the one-million-mile gas pipeline network—already in place and *virtually irreplaceable today at any price.*

Through this network flows more than half of America's residential home heating energy, and nearly 40% of the energy used by industry and agriculture. As this vast supply of clean natural gas moves to market, only minimal amounts of energy are used in transmission. That's energy efficiency.*

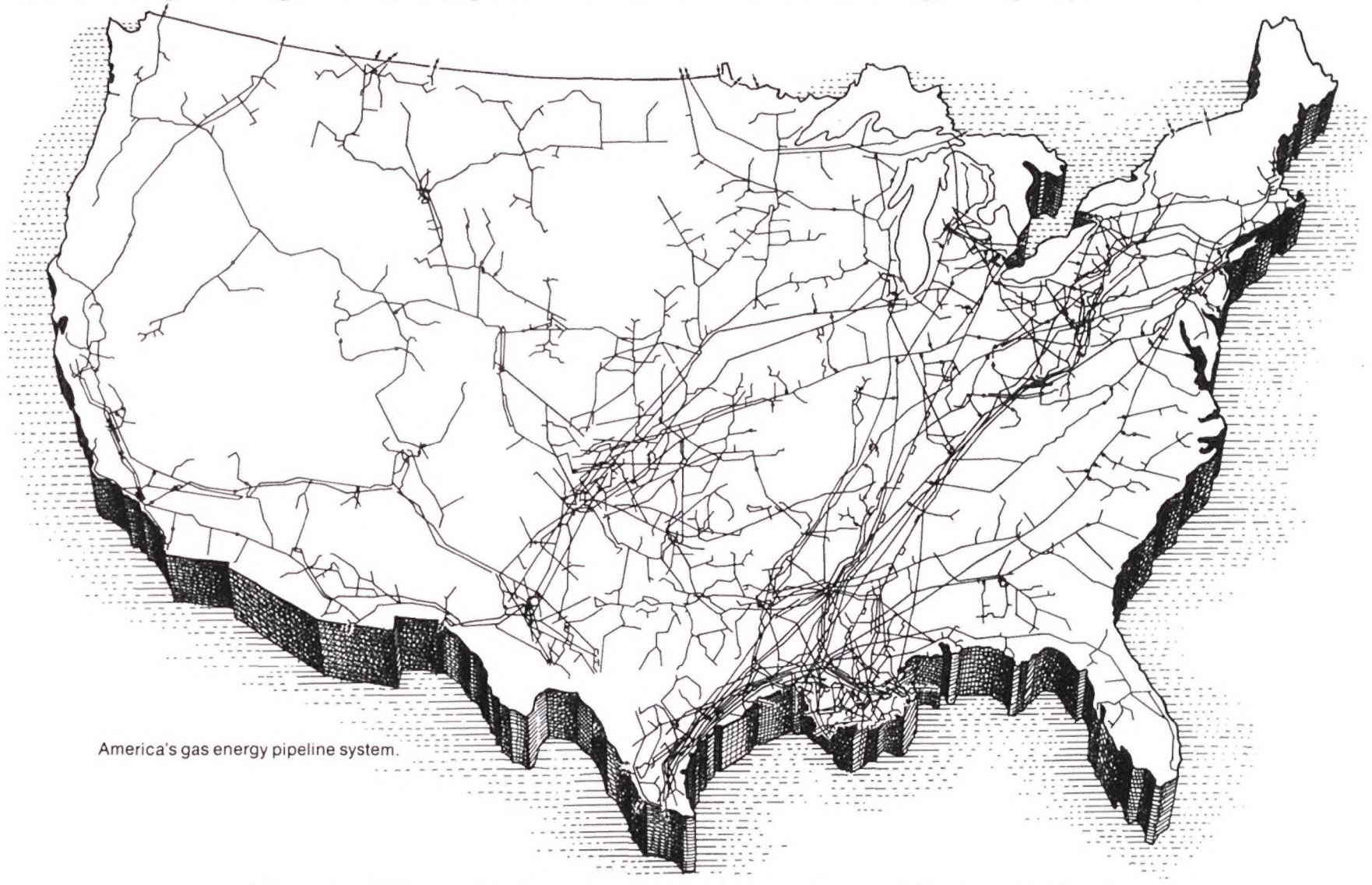
The result: when total fuel resource efficiencies are measured, gas emerges as our most efficient form of energy. For example, gas heating is nearly twice as efficient as electric resistance heating. In fact, compared to any form of electric space heating, including the heat pump, gas is more efficient.

Potential gas supplies to keep these pipelines flowing at capacity are enormous. Studies show that by the year 2000 the gas industry could be providing substantially more energy than it does today.

There's much more gas still underground than we've used so far. And there are supplemental sources like Alaskan gas and liquefied natural gas (LNG). More gas is locked in our vast coal reserves—and it's far more economical to turn coal into gas and ship it via pipeline than to convert it into electricity and ship it by wire.

The cost of creating new energy transportation and distribution systems and the many hidden environmental costs make our already existing pipeline an important national asset.

What we need today and tomorrow—clean, efficient, economical energy—the gas system delivers.



America's gas energy pipeline system.

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*For more information, write to American Gas Association, Dept. 12-D, 1515 Wilson Blvd., Arlington, Va. 22209

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Subscription price $12 a year in U.S. and possessions, $15.50 elsewhere.
Single copy price $1.25.
Second-class postage paid at Washington, D.C.
Editorial offices, 900 Jefferson Drive, Washington, D.C. 20560.
Advertising and circulation offices at 420 Lexington Ave., New York, New York 10017.
Please address all subscription correspondence and change of address information to P.O. Box 2955, Boulder, Colo. 80322

March 1980

Smithsonian

Volume 10, Number 12

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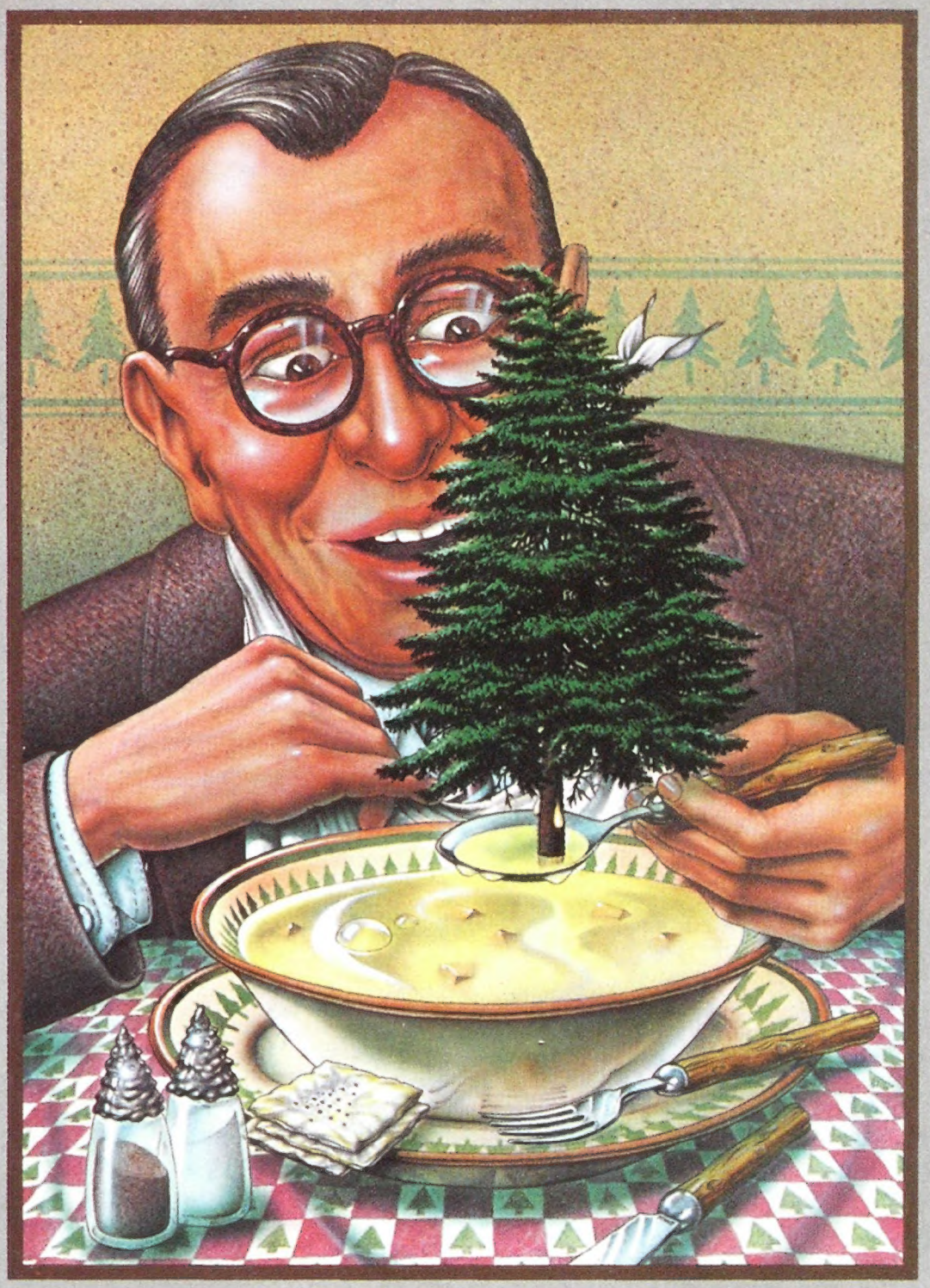
"Waiter, there's a tree in my soup."



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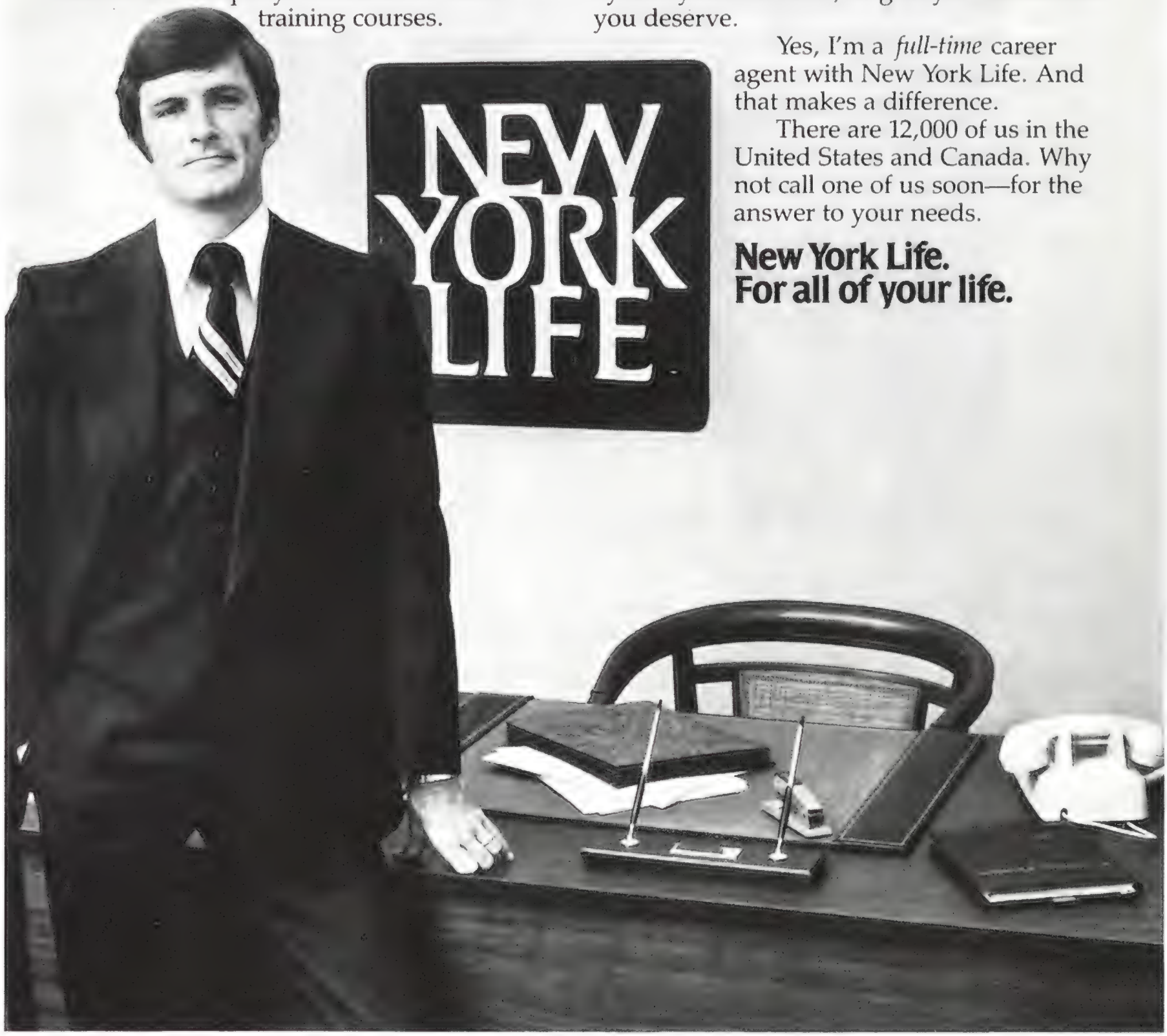

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Joe Holland works at Bethlehem's Boston Ship Repair Yard. He was awarded a new car for his better idea: a method for using otherwise lost heat in powerhouse boilers.

Harry Welcomer, who works at Bethlehem's Steelton, Pa., Plant, was awarded $5,000 for his better idea: a new, adjustable electrode for an automatic welding machine.

Joe Dingus, of our Buffalo Tank Division, was awarded a new car for his better idea: an inexpensive template to facilitate intricate burning of steel plates during fabrication.

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In some ways, inflation is like the weather: everybody *talks* about it, but nobody seems to know what to *do* about it.

That needn't be. At Bethlehem, we believe our "Take It To The Top" program is one step in the right direction. By offering valuable awards, the program encourages employees to tell us how we can work smarter and cut costs. That improves productivity. And the more productive we become the better we can fight inflation.

During our 1978 program, our employees turned in more than 9,000 ideas for new ways of working smarter. We estimate savings, over the next three years, of more than $15 million solely from suggestions generated by that year's program.

"Take It To The Top" worked so well for us in '78 that we're doing it again in 1980. And there's no reason why it can't help other Americans contribute to a more productive America.

Everybody has a better idea

Think about it. *Your* idea for cutting inflation down to size may be a way of doing a job for less money...of getting tools, systems, or equipment to work more productively...of making the nation's tax dollars work harder to accomplish more.

Let's all take it to the top

Your better idea *can* make a difference. That's why we've left the opposite page blank. We hope you will use it to describe your better idea and then send it to someone who can do something about it. That someone may be President Carter...your boss...your governor...your representatives in Congress...????

Your idea can help. And that's reason enough to take it to the top.

Bethlehem

Working Smarter

Dear _____

I want to help our country fight inflation by sharing my better idea with you.

My better idea is:

Sincerely,

P.S. Bethlehem Steel suggested I take my idea to the top. That's you.

Secretary Ripley's comments

The view from the castle

The magazine closes out its first decade of helping the Institution pursue its aim, the "increase & diffusion of Knowledge"

With this issue we come to the end of the tenth year of SMITHSONIAN, a magazine created to carry the message from Washington to the rest of the country that this Institution serves our citizens. It was to make patent the truth that the Smithsonian belongs to everyone, everywhere in these States, and that its purpose is for the "increase & diffusion of Knowledge among men," as James Smithson had dreamed.

The Institution is large, but it is not monolithic. Although most of our support for buildings and research has come from government appropriations and grants, we have depended on endowments and gifts to start the magazine and for most of our outreach to people everywhere. We are not concerned with propaganda, for if we were, we could not increase and diffuse knowledge. Nor are we biased—except in favor of art and beauty, the understanding of the meaning of history, and the interpretation (as best it can be transmitted) of the observations made in science.

We want to encourage people everywhere to think more deeply about museums and the meaning of their collections, to support the understanding of objects made by the hands of mankind and the evidence of the truths contained in the works of nature. If our reaching out through this magazine and cognate publications to our Associates and their friends can accomplish a tithe of this, then all the history of the Institution, its struggles and the funds given for its support, will have been worthwhile.

Why is it that we can never solve two riddles concerned with mankind: the ability of humans to create and develop concepts, without parallel in the history of evolution, and coupled with that, inexorably, our ability to be cruel to each other? No other animal species is possessed of such opposing instincts. These contradictions become the pride and the bane of our life on Earth.

Our task in the Smithsonian should be to cultivate the spirit of conservation, of the saving of objects, so that mankind can benefit in the future. Thus, perhaps, our spirits may be so enriched in the process as to remove, at the least, some small part of that cruelty and rage which produce the destruction of our history and our claims to uniqueness as humans.

In all this work, no one has seen the issues more clearly and blended our subjects together more skillfully than the Editor of this magazine, Edward K. Thompson, now on sabbatical after ten years.

As President Jimmy Carter recently wrote him: ". . . You accepted the challenge of the Smithsonian and helped bring the superb blend of arts, history and science that makes the Institution's museums so unique and so valuable, to the printed page.

"Throughout the years, you have done as much as any figure in modern journalism to help Americans learn about and enjoy the world around them."

Thank you, President Carter, for those true words, and thank you for your broad understanding of our attempted task. It is an unending one, and necessary in the doing. The world at large is still a most troublous place. Man's inhumanity to Man is pandemic. But an understanding of history, culture and science may be the surest panacea for the future.

S. Dillon Ripley

For 1980, Mercedes-Benz introduces the most relentlessly efficient automobiles in its history.

Stringent efficiency is no sudden demand to the engineers of Mercedes-Benz. For 94 years they have built cars with little else in mind.

And for 1980 they have inched the standards up another notch. Without downsizing bodies or engines, without slashing weight or cutting corners in quality or safety or comfort, they have created the most relentlessly efficient Mercedes-Benz automobiles yet.

Diesels—and more power to them

In any ordinary year, it would be major news that Mercedes-Benz engineers had boosted the performance of their Diesel-powered cars.

And boost it they did—to a healthy degree. The muscular 300 SD Turbodiesel is even more muscular. The five-cylinder 300 TD Station Wagon, 300 CD Coupe and 300 D Sedan move more briskly. The 240 D Sedan enjoys new punch.

But 1980 is no ordinary year. The best news is that the legendary Diesel fuel efficiency remains legendary.

The pleasant shock of efficiency

All six Mercedes-Benz gasoline models remain on the leading edge of automotive technology for 1980.

In these cars for 1980, fuel efficiency gains some makers might be pleased to achieve in two, three or five years have been achieved in one. Advances ranging from a 14.3* percent increase in fuel mileage for the 280 CE Coupe, 280 E and 280 SE Sedans, to a 33.3 percent gain in the 450 SEL Sedan, the 450 SL Roadster and the 450 SLC Coupe. Compare this to other cars. Your mileage may differ depending on speed, weather conditions and trip length.

In 1980 as in 1886

Every car maker today speaks of its products as being "right for the times." Mercedes-Benz is no exception.

But there is one difference. Making its cars more efficient does not loom only as "the challenge of the eighties" at Mercedes-Benz. It has *always* been the challenge.

Engineered like no other car in the world

*California estimates vary.

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If nobody plants the seeds, where is the corn going to come from?

Research and development is the "seed corn" for this nation's industrial sector. R&D spawns innovation, invention, and the technology that has made America the most productive nation on earth and, in the process, has created hundreds of thousands of new and better jobs.

For the United States to maintain its industrial leadership, significant continuing expenditures for research and development must be made. Instead, expenditures are declining. Less "seed corn" is being set aside.

The reason is that today's governmental and inflationary environment actually *discourages* innovation and new ideas. The result: delayed governmental approvals and arbitrary application of rules smother incentives for developing much vitally needed new technology related to energy. Regulatory indecision is currently hampering "full-speed-ahead" production of heavy crude oil, the gasification of coal, and the extraction of petroleum from shale deposits.

With arbitrary regulations and persistent inflation, business planners find it almost impossible to forecast accurately the total cost of developing a new product, bringing it on stream, and marketing it successfully. In the face of such uncertainty, it's no wonder that many American businessmen now refuse to risk funds in new programs and new ventures.

Investment in R&D by private U.S. industry dropped 32% as a percentage of G.N.P. from 1968 to 1978. Why? Because industry concentrates its "seed money" on low-risk, small-scale projects with quick payoffs. By way of contrast, R&D expenditures by the USSR, Japan and West Germany in the 1968-1978 period were up nearly 60% as a percent of G.N.P.

What's the solution? Chase believes it lies in taking the chains off the free market system:

- By reducing government overregulation.
- By placing time limits on agency approvals of new projects or products.
- By allowing tax credits for R&D that would stimulate business investment for basic research and new product development.
- By permitting a faster rate of depreciation of capital equipment.

R&D has produced the technology that makes this country the world's leading industrial nation. However, because a number of other countries are increasing their investment in R&D, competition gets tougher each year. To maintain our leadership, we must enhance the rewards for inventiveness and encourage greater R&D efforts more than ever.

Turning our research and development decisions over to regulators for whom the safe and easy answer is always "No" leads only to one end: Stagnation and Decline. Which is not our idea of what America's future should be.

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Letters to the Editor

Cover (volcano on Jupiter's Io)

Dear Sir: To my surprise, the January SMITHSONIAN and the January *National Geographic* carried identical pictures on their covers. In my 60 years I do not recall seeing the same cover pictures on two national magazines in the same month.

How did it happen?

Frank Burson
Brandon, Florida

It was pure coincidence. This image of a live volcano erupting on Jupiter's moon Io was so striking and scientifically illuminating that it seemed a natural choice. In addition to SMITHSONIAN *and* National Geographic, *it also appeared on the cover of* Scientific American, *the* Arizona Alumnus *and even a Chinese nature journal,* Ziran Zazhi. Ed.

One-eyed jacks

Dear Sir: To his galaxy of "one-eyed jacks," author Robert Wernick might have added two legendary figures, Horatius at the bridge and the Spartan lawgiver Lycurgus. Among the real one-eyed men of history are the great Carthaginian general, Hannibal; the charismatic Roman leader of a Spanish revolt, Sertorius; and the colorful Batavian rebel, Civilis, whose adventures intrigued both Tacitus and Rembrandt. All of these worthies appeared in my article, "The One-Eyed Man Against Rome," in *Historia.*

Thomas W. Africa, Professor of History
State University of New York
Binghamton, New York

Dear Sir: I would like to add to the one-eyed personalities the great hooknosed

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And that will please John H. Steinway very much. Write to him for more information at Dept. 24, 109 West 57th Street, New York, New York 10019.

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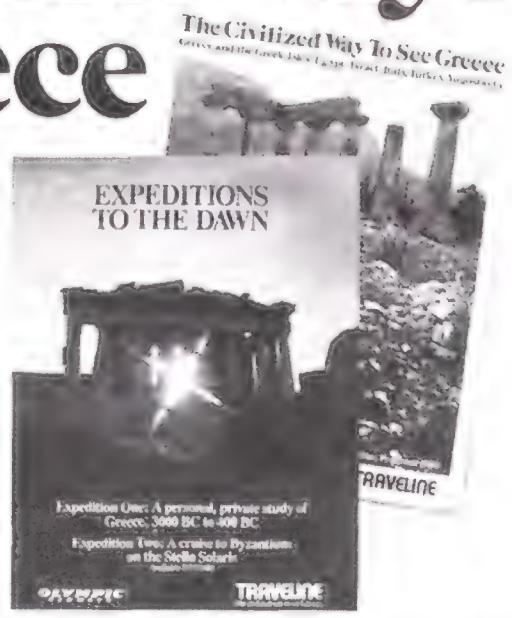
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condottiere and most important art patron of his time—Federigo da Montefeltro, the husband of the famous Battista Sforza, whose portraits by Piero della Francesca (Uffizi, Florence) show him always from the left side [see below]. He lost his right eye in a joust.

Paul Elbogen
San Francisco

Dear Sir: One thing in the article that troubles me is the author's statement that he "would not recommend a one-eyed brain surgeon," even though the monocular vision would not affect most other jobs. It happens that my father is both one-eyed and a brain surgeon and, as far as anyone I know can see, he has little trouble, if any, in dealing with his situation. Furthermore, the only aspect of his life that has changed since he lost his sight is his ability to catch the car keys when I toss them to him.

If it means anything, my father is also president of the Tennessee Medical Association. This should demonstrate the amount of trust placed in him.

J. William Hays
Williamsburg, Virginia

Dear Sir: "One-eyed jacks" seemed a delightful bit of fluff on the Cyclopean genre until we discovered the example of the one-eyed image adorning the Great Seal of the United States with those two near-inscrutable inscriptions and date.

When we found that MDCCLXXVI was not only the date of the Declaration of Independence but that of the found-

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ing of the society of the Illuminati (that all-seeing, all-knowing secret society aimed at the overthrow of constituted order in 18th-century Europe), that *novus ordo seclorum* was literally "new world order," and that *annuit coeptis,* loosely rendered, meant "God has smiled on our undertakings," we began to wonder if Big Brother hadn't mistaken himself for God and was looking for a toehold in respectability.

Roy L. Goodale
Glendale, Arizona

Dear Sir: As one who was raised on J. M. Barrie, I can assure Robert Wernick that Captain Hook had two eyes. To quote Barrie's description of my favorite villain: ". . . His hair dressed in long curls which look like black candles about to melt, his eyes blue as the forget-me-not and of a profound insensibility, save when he claws, at which time a red spot appears in them."

Hook had one hand, not one eye; his hook made him sinister enough.

Mary Elaine Bellmere, M.D.
Cincinnati, Ohio

Dear Sir: Having been a member of the "monocular minority" for 35 years, I feel fully accredited to comment on the use of one eye compared to two.

Competitively, the one-eyed people have a certain neurotic urge to continually prove over and over their ability regardless of what other people view as a handicap. The stresses created by the monocular condition make it egotistically crucial to be better than our peers.

W. Thomas Peschel
Syracuse, New York

Jasper Cropsey

Dear Sir: It was with rare pleasure that I read your article on Jasper Cropsey's life, art and the loving restoration of his home at Hastings-on-Hudson, New York.

Having served as a volunteer tour guide and researcher at the 19th-century castle "Olana," home of the landscape artist Frederic E. Church, I have seen the increasing recognition fine artists are now receiving from the American public.

We are indeed fortunate that their homes and paintings are being preserved in all their glory for future generations to know and appreciate.

Kristine Kelly
Voorheesville, New York

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Tennessee Valley Authority

Dear Sir: Cassandra Tate wrote a good article on the TVA, but she was misinformed on one point. It was not David E. Lilienthal but my father, Arthur E. Morgan, who was the first chairman of TVA. It was his engineering and organizational genius that gave the TVA its essential direction in its goal to touch and give "life to all forms of human concern."
Ernest Morgan
Burnsville, North Carolina

Dear Sir: In speaking of the Tellico Dam, the author states that "it would destroy one of the last free-flowing rivers in the region." There are, and have been for more than ten years, seven dams and reservoirs upstream from the Tellico Dam —the sum total providing an appreciable amount of storage for regulation of downstream flow.
Don H. Mattern
Knoxville, Tennessee

Japanese artisans

Dear Sir: I read your article on Japan's "Holders of most important intangible cultural properties" with mixed emotions. How admirable that these people are recognized for the skills they hold, but how sad that we have no such program.

For too long this country has had a love affair with youth, pushing aside the aged with their priceless knowledge and skill.
Cynthia M. Carrington
Pittsburgh

Dear Sir: As a former resident of rural Japan and a longtime researcher of traditional Japanese crafts, I took pleasure in your article on Japanese art, but wish that you had treated the subject in more depth. The reason is that a great number of incredibly refined and unique crafts are on the verge of extinction. In only a few exceptional instances are young people willing to apprentice themselves to master craftsmen whose skills and techniques, until now, have been safely passed from generation to generation.

Today, it is still possible for the foreign researcher through painstakingly developed social contacts to document and record their techniques. I doubt if, in ten years, that opportunity will remain.
Robert E. Debold
Reno, Nevada

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It takes the best people to make the best airline. Vickie Getz is one of them, and we thought you'd like to meet her.

Just ultrasound them varmints...

Dear Sir: In Patrick Ryan's article, "Now, just ultrasound them varmints to death," ultrasound rodent devices are presented as the newest weapon in the eternal battle of mice and men. These devices are not new—they have been around about 20 years.

There is little data, apart from the speculation of BBC engineers based on empirical evidence, to support the efficacy of ultrasound in rodent control. In fact, tests by several independent researchers indicate that ultrasound will *not* prevent rodents from feeding in the target area. Environmental Protection Agency (EPA) research supports the conclusion of these independent studies.

Ultrasound was not the principle behind Bob Brown's "Ecology Machine," but electromagnetism, a concept tested by EPA and found to be ineffective for pest control.

EPA has banned the sale of most electromagnetic pest-control devices and is in the process of taking action against other devices on the market suspected of operating on this principle.

All in all, the traditional cheese-loaded weapon may not yet be obsolete.

A. E. Conroy II
Director, Pesticides and Toxic Substances
Enforcement Division, EPA
Washington, D.C.

Phenomena, comment and notes

Dear Sir: I received my January issue of SMITHSONIAN four days before Christmas.

In response to James K. Page jr.'s "Happy New Decade," I am inclined to wish that he shortly be engulfed in a sea of acid rain, nuclear waste, declining resources, and leavings from immobile cryptic polygamous birds. Being of a charitable nature, however, I decided instead to wish him a Merry Christmas, but since Christmas 1979 will have passed before you receive this, it will have to be for Christmas 1980 (provided any of us should live so long).

Peter M. Coope
North Stonington, Connecticut

Mr. Page clearly has a problem with seasons, taking them more seriously than we think he should. Recognizing this fault, he took therapeutic action (see his February column) and reports that his Christmas was exuberantly merry. Ed.

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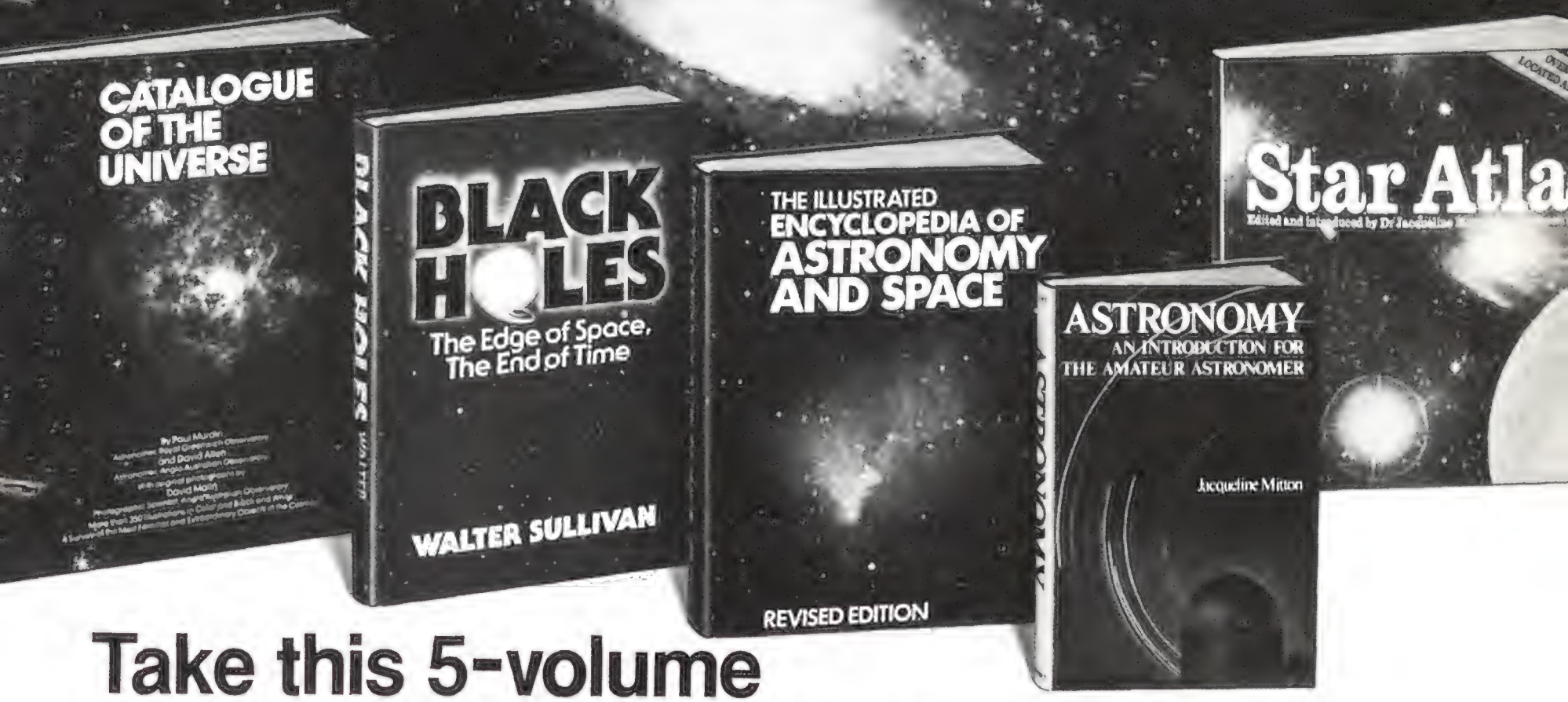

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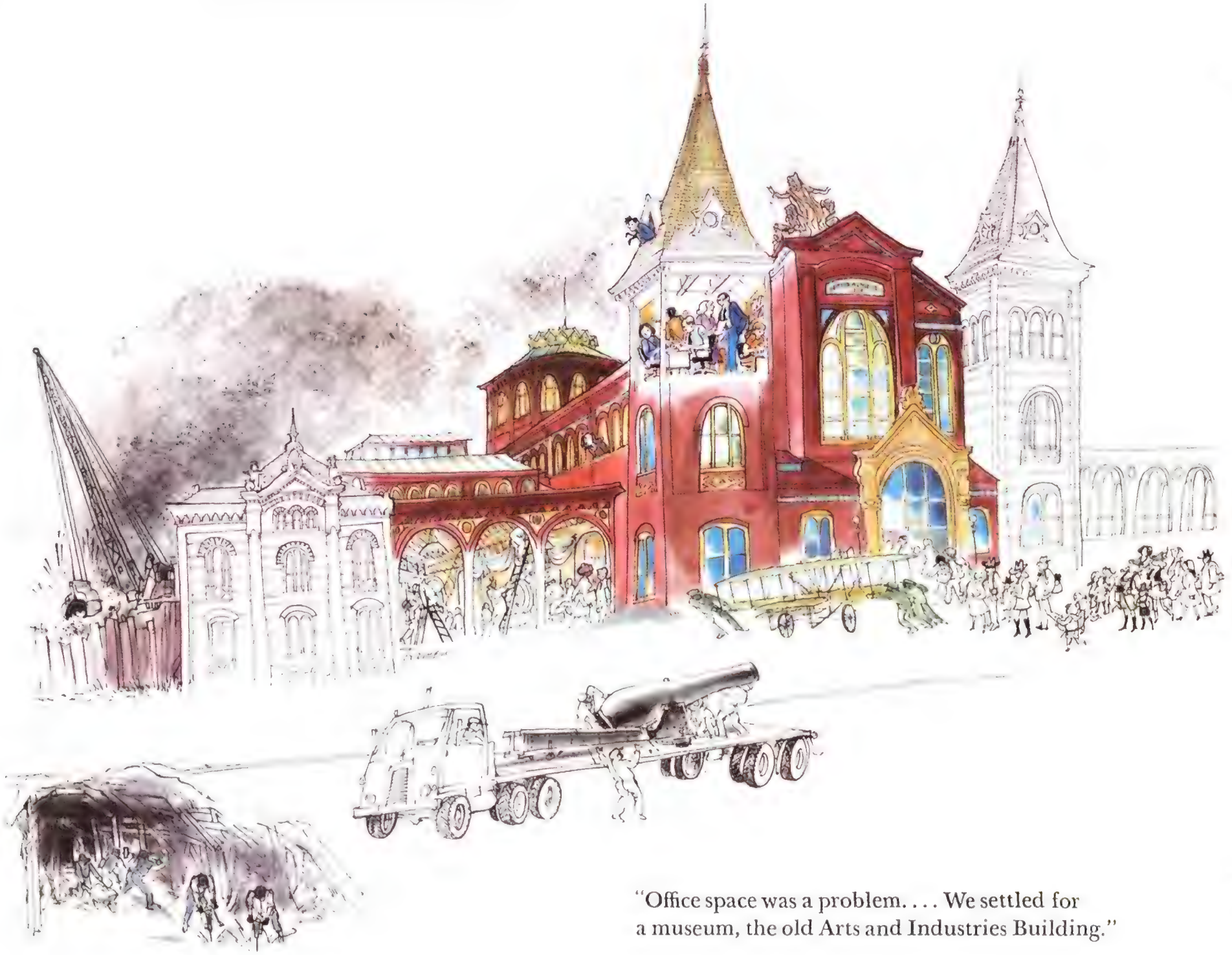


"Office space was a problem. . . . We settled for a museum, the old Arts and Industries Building."

Around the Mall and beyond

A few recollections about SMITHSONIAN*'s birth: musical offices, a disappearing restaurant, a 40-foot feather duster, a letter to Mr. News*

Looking back over our first decade, we at SMITHSONIAN recall a great many moments when we weren't at all sure of what we were doing. At no time was this dereliction more general than in the months preceding April 1970, when our first issue appeared.

In that prenatal period, a small cadre of us had been gathered at the Institution to establish some sort of magazine personality. It wasn't easy. "So you're going to put out a new magazine," fellow journalists would say. "What's it going to be about?" At that point we would see someone across the room.

We knew little about our intended audience. Every morning we battled through hordes of museum viewers as we moved from one office to another. There were vacationers from New Mexico, the whole family in ten-gallon hats; airmen from the Forrestal Building, strolling with their girls; tour groups from Bavaria, all in lederhosen and feathered hats, with Leicas around their necks; the same from Japan, all in blue serge suits and Givenchy traveling jackets, armed with Nikons; preschool children linked together with string like sled dogs, teacher holding the reins. Did these constitute our audience? Would there be more?

We didn't even know each other. We soon set about remedying this by having lunch together. Every noon we would go off like a flock of sparrows to some nearby

Drawings by Gloria Kamen

feeding station where we could chitter away at each other in search of common ground.

We learned a bit—mostly about restaurants. There was one we especially liked, a Washington institution named Hall's—superb Chesapeake Bay seafood, photographs and mementos on the walls that looked as though they dated back to Civil War days, waiters of the same vintage, sullen, but not really mutinous.

We established a small tradition of going to Hall's every Friday. And then one time we arrived and found nothing there. No building, no parking lot, no waiters, no sign. It had been spirited away and its cellar hole filled in and sown with salt. We never found out what happened to it. Perhaps it never really *was* there.

From firetrap to Black Hole

Office space was a problem. We were supposed to be close to the center of things at the Institution, but it's an establishment where the pulsing heart is elusive. We settled for a museum, the old Arts and Industries Building where the planes used to hang before the new Air and Space Museum was opened. Our first area was a low storage room in the Smithsonian Institution Traveling Exhibition Service. The room was filled with flammable material, but the Editor found room for a chair and a phone. And seeing that the projected magazine was thus physically settled, the head of the Traveling Exhibition people remarked, "Aha! The nose of the camel has entered the tent."

Secretary Ripley came to call, bumped his head and, from a half crouch, murmured that he thought the office "quaint." After two more moves, the Editor took a series of photographs to illustrate the horrors of the newest place and presented them to the Secretary. He thought the photographs were marvelous and hoped we would find a way to run them in the first issue.

We *did* move a lot. Actually, some of us have moved 19 times. One early office overlooked the major construction that was preparing the Arts and Industries Building to house the 1876 exhibition, while another project was undermining us for a tunnel to the Southwest Freeway. Our lives were filled with workmen climbing around our building and our conversations were punctuated by deep, distant explosions that rocked the coffee in our cups and sent plaster dust drifting down upon our desks. It was as though God were listening and disapproving. How well I remember that coffee, made from a pot of ancient water drawn from an ancient faucet at an ancient sink right in the Editor's office. We would barge in to get it started no matter what the Editor was doing.

The phones to that office were monitored by the Editor's secretary, an attractive young woman who affected a quill pen and who invariably answered a call with: "This is the office of the Editor of SMITHSONIAN magazine, the new national monthly publication of the Smithsonian Institution." I suppose that like the rest of us she needed to reassure herself.

We were moved all over the place. There was one interior storage room where four of us ended up—staring at walls without windows, gasping for oxygen. Inevitably, it was dubbed the Black Hole, and one claustrophobe moved out of it himself and placed his desk directly outside the Editor's office to serve as a haunting prod to the administrative conscience. For a while I was assigned to a tower, a lovely aerie with three windowed walls. But the heating-cooling system hemorrhaged fatally all over the rug and turned the office into a noxious bog.

A colleague of scientific bent found himself in an office that opened directly into a museum area. He got tired of sightseers opening his door to see what sort of exhibit he was, so he devised a carefully lettered sign that went something like:

Tropical Disease Research Authority
Official visitors only
Please check your special badge for
change of color

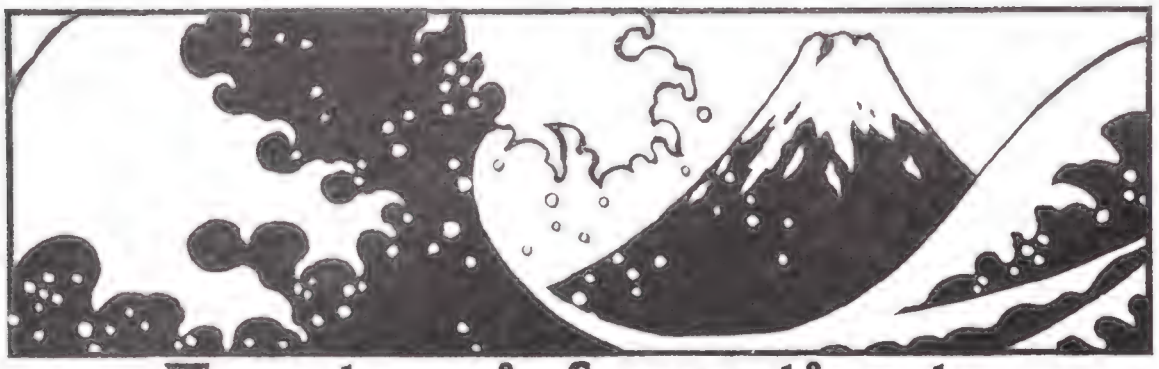
He emerged one time to see a mother snatching her child away from the door.

Our advertising and promotion people in New York fared little better than the editorial people in Washington. When first hired, the directors of those two departments could get only a couple of suites in a hotel of dubious repute in Manhattan's pornographic district. A couple of windows looked out on a brick wall two feet away, and two bathrooms were converted for storage—the tubs shelved over. Only the toilets remained operable—noisily so.

Using the bookies' phones

When our first ad salesman arrived on the job, he rechecked the address carefully since, as he says, it was the sort of place you would usually run, not walk, through. Soon a fire broke out in the hotel and destroyed the telephone system, so our salesman, and the two directors, used the phones in a tobacconist's down on the street, much to the disgust of the regular clientele, who were bookies. Every time the phone rang down there the bookies and the Smithsonian people dived for it simultaneously, elbows flying.

The marriage between professional journalism and the serene, scholarly world of curators and researchers was as uneasy at first as the hasty liaison with the bookies. The Smithsonian provided us newcomers with an unmatchable research facility, but there was a charming leisureliness about it that sometimes left us haunted by approaching deadlines. Curators and re-



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"... bumped his head and murmured that he thought the office 'quaint.' "

searchers, meanwhile, often looked askance at the prospect of publicity at the popular level, without the long, painstaking preparation that would be required in a scholarly journal. Gradually we adjusted, we struggling mightily for accuracy, they finding good grace with which to accept the best we could do.

The magazine started to come together, and we began to feel at home. We found the guards knew us. We said Good Morning to the man who dusted the planes—reaching up with a feather duster on a 40-foot pole to brush, ever so gently, the sacred wings of the Wright Flyer and the *Spirit of St. Louis*. A maintenance man would drop in and read us his poetry.

The National Associates (our subscribers, if any) were established as at least a sort of office. One man sat at a small desk behind one of the sofas in the Great Hall of the castle. His task was to greet National Associates, and he went for days at a time without anyone to greet. Today, that one half-hidden desk has sprouted into a complex that takes up the central part of the hall and behind which many people work steadily.

As we neared the deadlines for the first issue, the editors snuggled into their harnesses with almost a sense of relief. At last the unaccustomed planning stage was ending and the familiar work of production was looming. Editors hate to plan far ahead. It's a necessary chore requiring a lot of uncomfortable thought processes. But the business of getting articles into print—that's a pleasant routine.

Sometimes very pleasant. While at work on one of our early articles we welcomed the author to our offices so he could communicate directly with the Assistant Editor for that article, helping

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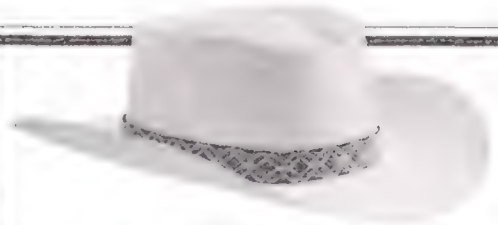

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solve research problems. They ended up getting married. She was a wonderful editor, but she went home and had what seemed like hundreds of babies, and we lost her. Since then, we've never allowed an author into the building except under strict supervision.

Ten years ago next month, with a wrench and a gasp, SMITHSONIAN was born. The first issue had courting elephants on the cover, remember? And very soon we found a new problem, an insane computer system that managed to foul up subscriptions beyond belief. The young woman who fielded telephone calls from subscribers had to be given rest and recuperation. We used to find her weeping hysterically at the phone, overwrought by the incredible situations that computer dreamed up. One subscriber, for example, called us in helpless rage because he'd received 400 copies of the same issue. There were so many SMITHSONIANS in his living room that he couldn't get in.

Anchorman John Chancellor noted in an evening broadcast that his television studio had received a promotion letter from SMITHSONIAN addressed to "NBC News" and starting out, "Dear Mr. News: . . ." We wrote him a note offering to send the same thing to Walter Cronkite, and Chancellor wrote back again saying it was OK, he took the magazine and loved it.

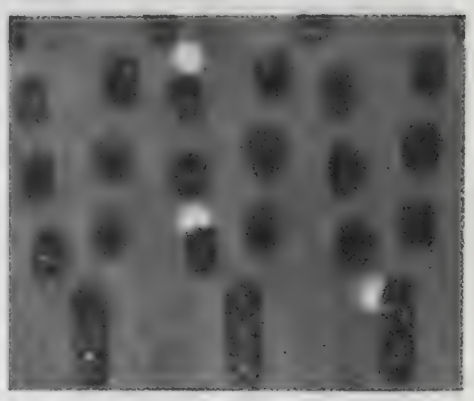
Thank God a lot of people loved it. Perhaps *I* wasn't all that sure why, but we had one person who *was* pretty sure. Edward K. Thompson, our founding Editor, now off on sabbatical as his birth-

". . . some of us have moved 19 times."

When is a bubble not a bubble?

Answer: When it's a magnetic bubble—a tiny magnetic area less than 1/10,000th of an inch in diameter contained in a thin layer of crystal. About five million bubbles have been stored on a crystal chip about the size of a dime.

The presence or absence of bubbles (the white dots in the photo at right) represents bits of information—ones and zeroes. They can be moved about at high speeds to perform memory and logic functions. Two perforated metal sheets (the holes appear as dark rectangles in the photo) create the alternating magnetic field that moves the bubbles around.



In this photo, magnetic bubbles (white dots) are magnified 1,000 times.

Putting them to work

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Magnetic bubble memories were invented at Bell Labs in 1966. Since then, we've been improving the technology constantly. With our latest advance—using the perforated metal sheets, instead of a pair of external coils, to move the bubbles—we've been able to cut the size of bubble devices by about a third, move the bubbles ten times faster, and cram four times as many of them on a chip.

Bubble devices are being put to use in telecommunications, data processing, and consumer electronics industries. Bubbles are particularly attractive in combination with microprocessors, providing program storage for a computer on a chip of silicon.

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"... a mother snatching her child away."

giving decade here ends, made it abundantly clear that SMITHSONIAN was going to make it . . . or else. Thompson, former Editor and Managing Editor of *Life*, is a hard-nosed professional with full understanding of the makings of a magazine.

Thompson was discovered by William Warner, then an Assistant Secretary of the Institution and later the Pulitzer Prize-winning author of *Beautiful Swimmers*. Mr. Ripley had dispatched Warner to scour New York for an able, experienced editor for the projected magazine. Warner soon learned that the right man was Ed Thompson and that he was working in Washington, right in the Smithsonian's own backyard.

At an early meeting with Mr. Ripley, Thompson used a phrase that came closest to defining the magazine: "It's about things in which the Smithsonian is interested, might be interested or *ought* to be interested."

Ed Thompson looks remarkably like Winston Churchill, smokes an endless chain of fat cigars, wears a Stetson hat that looks almost Senatorial, smiles puckishly when pleased and glowers stormily when not. His office memos are collectors' items. To one staff member after a dismal showing: "Your colleagues are aghast at your performance. You say it will improve. We await." And upon hearing that he was to be awarded the Henry Medal of the Institution for "his brilliant efforts to create and sustain the quality of the

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magazine SMITHSONIAN," he wrote all of us that "when a staff is ingenious, curious, hardworking and even loyal perhaps the most useful thing is for an editor not to stand in the way. . . ." That was high praise from Ed.

Ed Thompson, implacably demanding, unshakable in his quest for quality, is as inextricably tied to the first ten years of this magazine as are its logo, its ink, its paper. None of us can visualize a specific article in all those 120 issues without also picturing Ed. There he is, leaning on the light table, cigar smoldering. There he is, looking up from his typewriter, perhaps to give you hell for an oversight, perhaps to tell you an anecdote from his *Life* days. We still think we see him arriving in the morning in that damn hat, leaving later than almost everyone, a little stooped with weariness.

At editorial meetings he listens with great patience to the most junior member's most impractical idea—after all, this is journalism and, as he says, it's an honorable trade. As a friend he is thoughtful and generous. As a boss he can turn mottled with rage because of a mislaid transparency or smile benignly as his staff throws a party.

He mumbles. He mumbles so badly that I literally lived through a couple of curious weeks without being sure he had hired me. He knows, of course, that he mumbles. I suppose he does it on purpose for reasons of his own. I remember one memo, sent to all of us after we had coped with an unusually horrendous problem. "Thanks," he wrote ". . . not mumbled."

Happy sabbatical, Ed, and thanks for the decade.

—EDWARDS PARK

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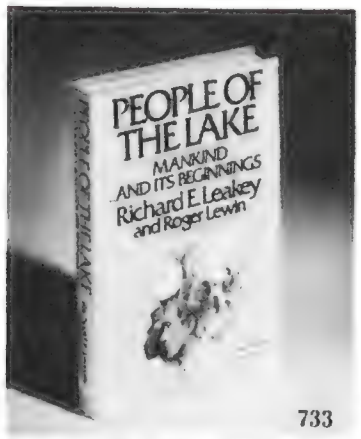

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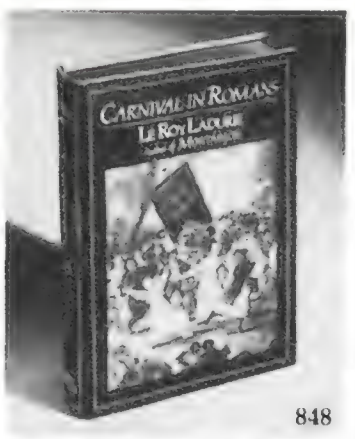

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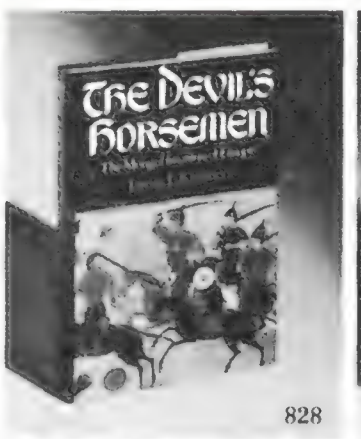

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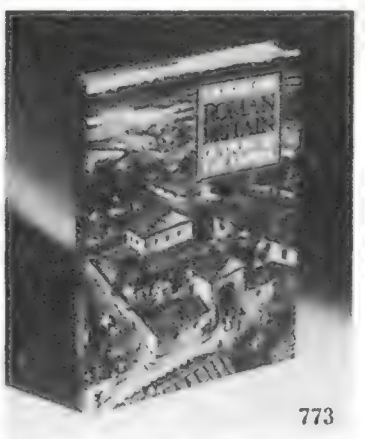

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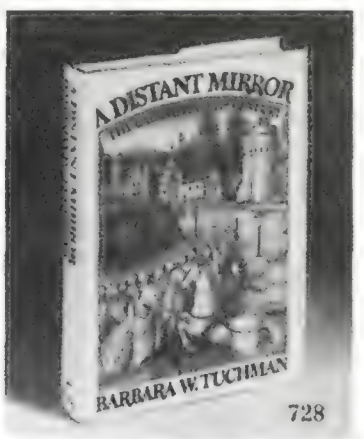

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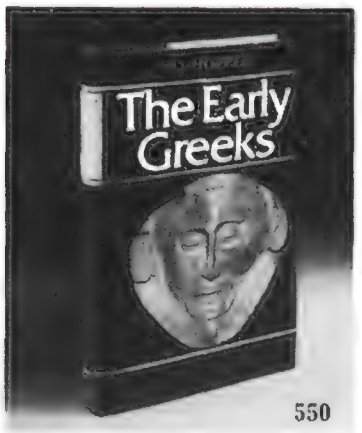

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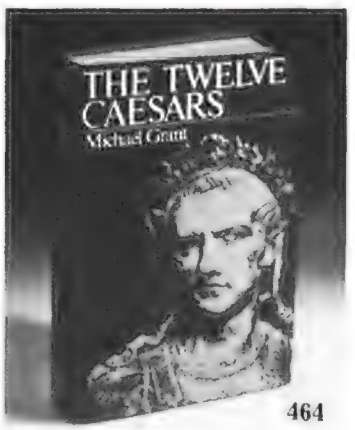

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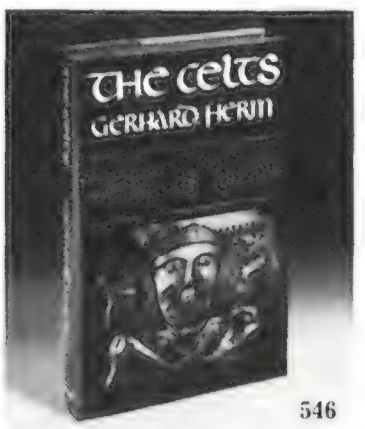

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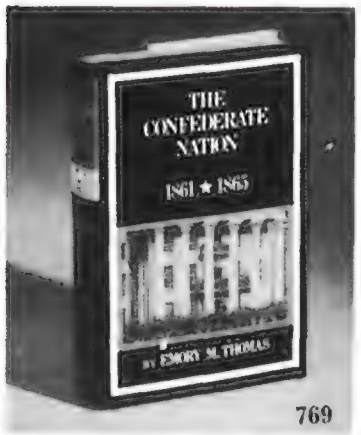

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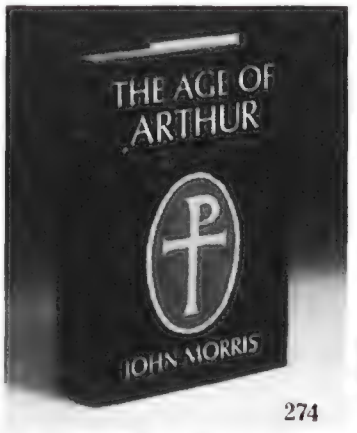

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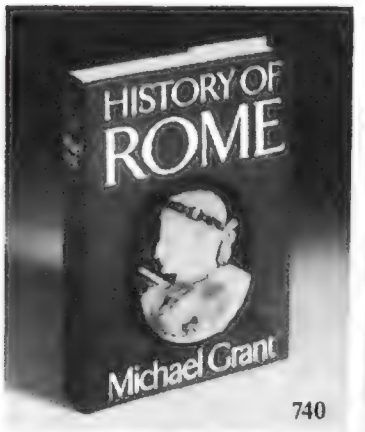

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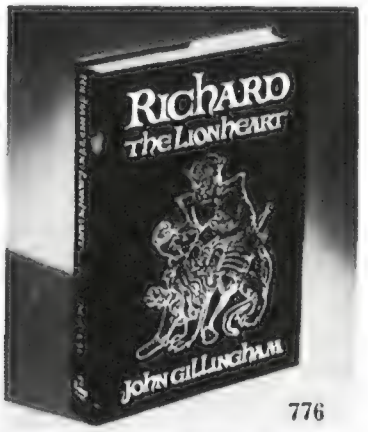

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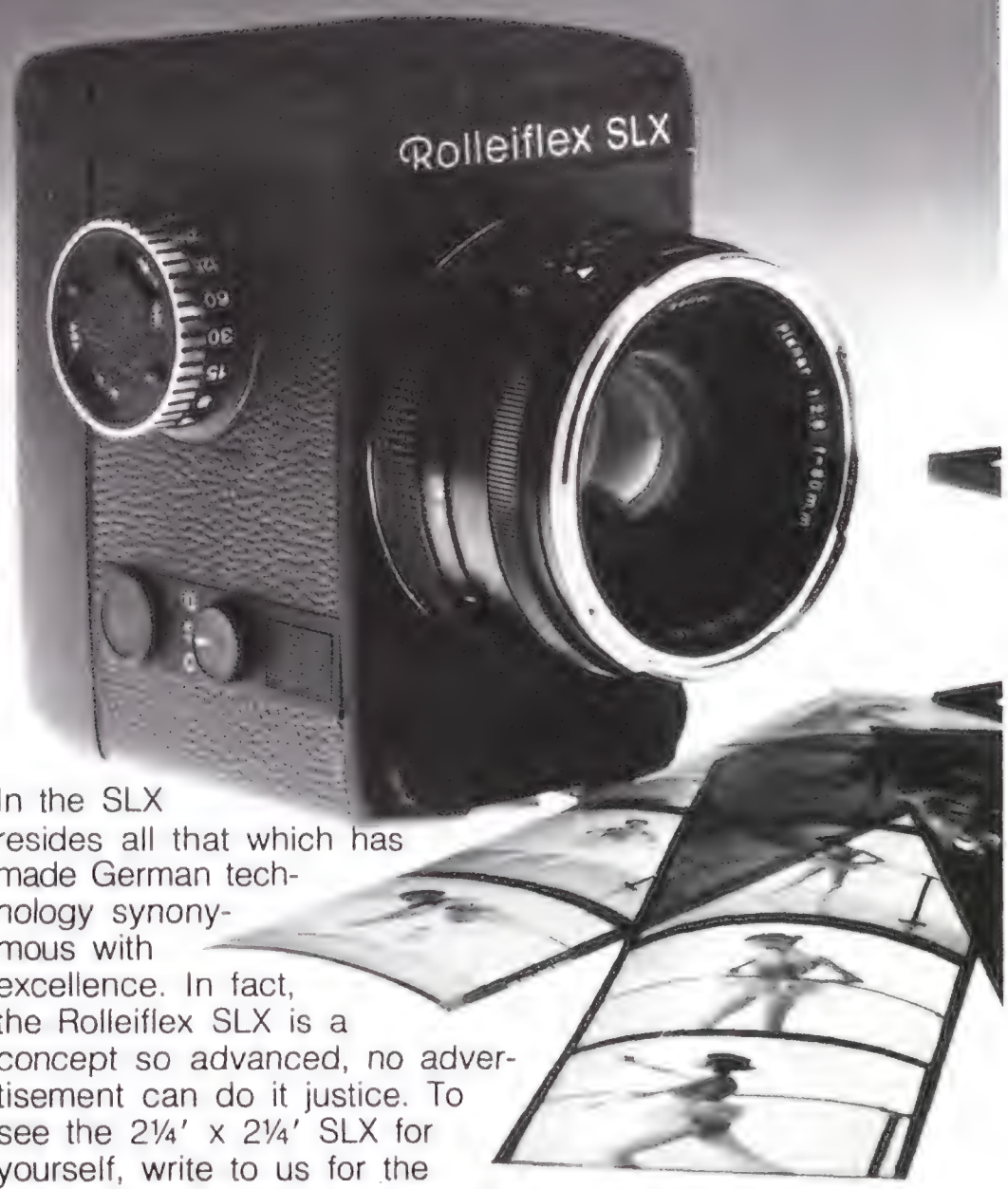

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Phenomena, comment and notes

Scientists bring us a little good news and a lot of bad news about energy, but ordinary folk are finding answers

Along with Shriners in town for the East-West football game, some 4,500 scientists and 500 science writers descended on San Francisco in January for the 146th national meeting of the American Association for the Advancement of Science. Some of the news was good. Immunologist Joseph M. Davie of the Washington University School of Medicine in St. Louis, for example, reported that we're getting close to being able to remove the "signal cells" from an organ before we transplant it. The host body would then be unable to recognize it as foreign and would not reject it, so there would be no need for drugs to suppress the immune response and thus make the host susceptible to every threat that came along. Biochemist Daniel E. Koshland jr. of the University of California at Berkeley explained how bacteria could be manipulated to create higher quantities of alcohol, a twist that could make the net energy picture infinitely more attractive. And there was lots more.

But some of the news was bad, so bad that you felt a chill sitting in the appropriate semidarkness of the Hilton's Continental Parlor 8. A panel of heavy hitters in the energy field, representing most wavelengths of the ideological spectrum, agreed that the transition decade of the 1980s will almost certainly include energy-induced disruption, possibly up to and including war and economic collapse.

Chauncey Starr, vice chairman of the

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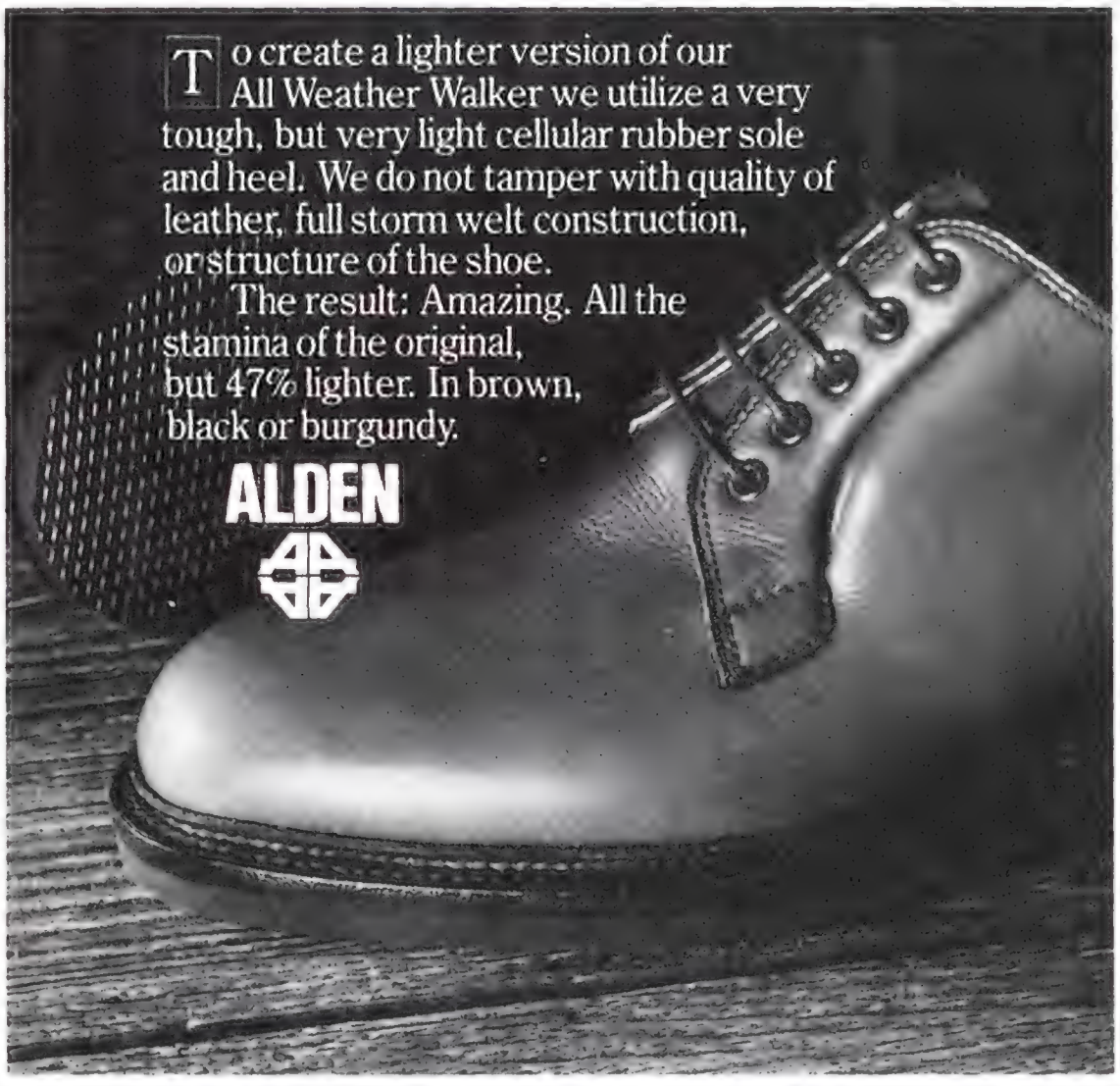
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Electric Power Research Institute, led off: "It is very difficult to be both realistic and hopeful. No matter how much energy we conserve, we will remain on the brink of catastrophe."

John O'Leary, former number-two man in the Department of Energy, followed: "I look upon the next decade as one of unmitigated gloom; it could only be relieved by a deep and protracted recession." O'Leary said world oil surpluses are disappearing and that, even without any political crises, the price will be $50, $60, even $100 a barrel by 1990.

But O'Leary is sure there will be at least one crisis bad enough to cut us off from a substantial volume of oil for enough time to hurt. The result will be "almost horrible," he said, "and could precipitate military action."

Daniel Yergin, co-editor of the Harvard Business School Energy Project's surprise bestseller *Energy Future*, argued that the crisis is here: "We are now already in a very serious energy emergency," he said, and are spending $1.7 billion a week for imported oil. Soon there will be no place to buy any more, he felt, and zero-energy growth will be imposed on us whether we like it or not.

Barry Commoner, now both professor and third-party activist, said the exponentially rising cost of producing nonrenewable energy is cannibalizing the entire economic system. An ever-increasing proportion of the nation's economic activity is devoted to producing the energy to run the system, a trend that must lead to economic collapse.

Dennis L. Meadows, a public figure since his 1972 report to the Club of Rome on the limits to growth, noted that after eight years as the most pessimistic member of such panels he had become the most optimistic, even though his views had remained the same. But he, too, predicted interruptions in the oil supply.

The former MIT professor did inject a note of hope, though. Despite the lack of will at the national level, Meadows said, the trend of the solution is now becoming obvious around the country. Individuals, small businesses and whole communities are taking the initiative, cutting their energy use and finding other ways to produce what they must have.

And that news is not only good, but somehow satisfying. While the federal government invests billions in nuclear

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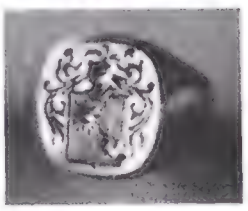

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power and millions in exotic power towers and monster wind generators, ordinary citizens are not waiting like pets for the sound of the can opener. In my neighborhood, the automatic oil burner hidden in the basement is giving way to the very visible wood stove, and the neighborhood children now know how much energy weighs.

Articles in places like *Mother Earth News* describe energy-saving ideas that are provocative in their simplicity, such as the man who took the engine out of his Opel GT, replaced it with a jet engine starting motor, some batteries, and a generator run off a lawn-mower engine, and now gets 75 miles to the gallon. One is left with the happy suspicion that we can do it better ourselves, anyway.

In San Francisco, one invitation to do it ourselves came from a man who is doing just that and has come up with a scheme in which the residents of every county in the country can do just that. Jim Benson runs something called the Institute for Ecological Policies in Fairfax, Virginia. After working at the Energy Research and Development Administration (now part of the Department of Energy) and the Council on Economic Priorities, Benson decided the best place to start on energy is at the bottom. (He has little government or foundation money; when institute funds run low, Benson takes outside consulting jobs to replenish the kitty.) So he and his institute have come up with the *County Energy Plan Guidebook*, written by Alan Okagaki and Benson. It is a handbook that working groups of local citizens can use to make and carry out their own energy plans. The idea is first to identify all the energy used in homes, business, industry and transportation, project use to the year 2000, and determine how much could be saved where and at what cost. Work groups would then look for all locally renewable energy sources and see how much of the demand these sources could meet.

Everyone who orders the guidebook will receive the *County Energy Plan Newsletter*, which carries news of projects under way. And later every working group will report its plans and progress back to the institute so that information can be shared with every other group.

It is too early to know how well the idea will work (so far some 5,500 copies have been distributed), but it does seem a

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All in all, in a time of lowered automotive expectations, amidst increasing mediocrity, the engineers at BMW have actually improved the BMW.

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promising manifestation of the trend Dennis Meadows discerns. (There are other aids for the citizen analyst, of course. One of the best is *Creating Jobs Through Energy Policy* by Meg Schachter, published by the Department of Energy in 1979.)

Just a week after the San Francisco panel offered its gloomy assessment, the National Academy of Sciences published the report of the Committee on Nuclear and Alternative Energy Systems (the acronym is CONAES, worth remembering because we will see it a lot as the energy debate intensifies). The four-year, more than $4 million study, aimed at the period from now until 2010, offers little encouragement for renewable energy or small-scale efforts and seems likely only to intensify the debate, if not the confusion as well. Few will quarrel with the committee's first priority, which is to reduce the ratio of energy demand to GNP by as much as half. But the very next CONAES priority is "vigorous exploration" for oil and gas and creation of a synthetic fuels industry. (For a look at how one Montana county views the prospect of a synfuel plant, see the article on p. 70.) Following on the committee list are more coal and nuclear plants for electricity generation (with coal to be phased out around the turn of the century as it becomes increasingly needed as a source of synthetic fuel), continuing research on breeder reactors and, lastly, spending now for research and development to be sure we have more energy options to choose from over the long term.

For the rest of the century, the committee expects little contribution from solar energy. Most solar technologies will remain uneconomic, the report says, and hydropower and terrestrial biomass plantations both appear to present insuperable ecological drawbacks.

With our fuel gauge edging closer to empty, the country seems immobilized, paralyzed in part by what the San Francisco panelists called (and themselves represented) the ideological debate between hard path and soft, between big and central on one side and small and neighborhood on the other. It is nice to know that on the invisible level of individuals, small businesses and communities, where all of us actually live, things are happening. One can hope that this is, indeed, the future.

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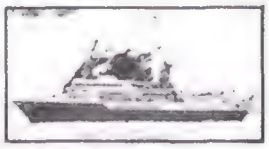

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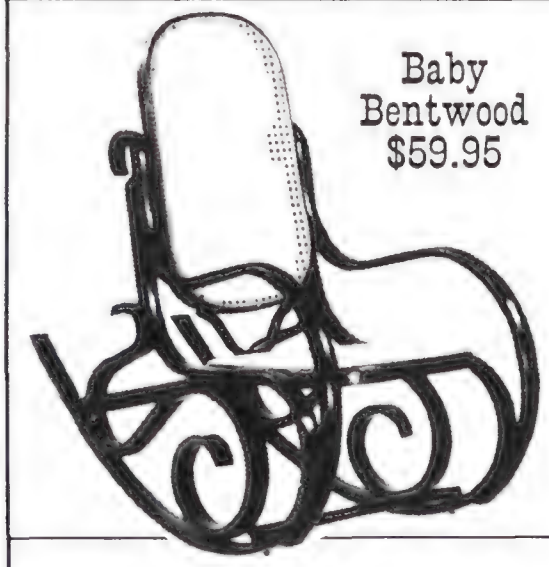

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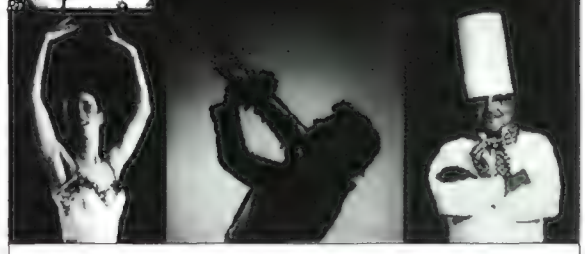

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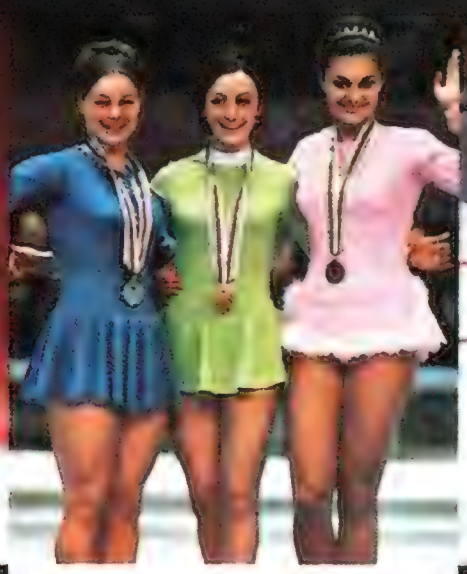
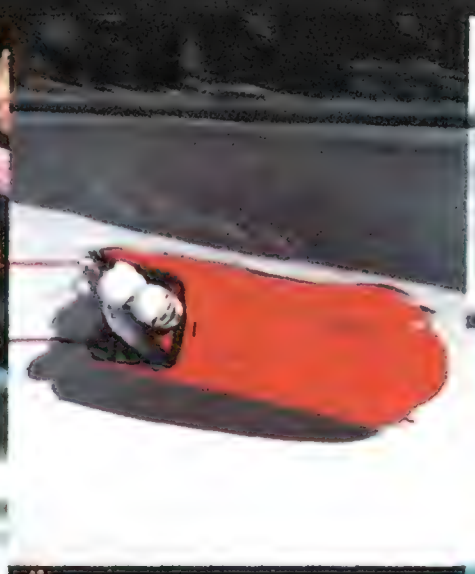
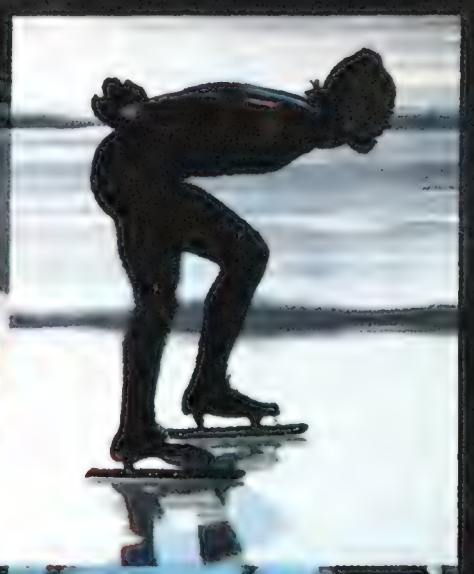

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Nothing in the world of competitive sport can match the Olympic challenge. It is a challenge that demands not only the best in human athletic achievement, but a determination that can be summoned up to overcome seemingly impossible obstacles. Yet with all the talent, skill and dreams the Olympic Games focus into crystal clarity for a brief instant, there can be only a few who wear the gold.

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RECALL THOSE GOLDEN MOMENTS

Give Her a "Golden Moment" Hourglass Pendant— An Exquisite Gift of Rare Beauty which uses Gold dust to Dramatically Express Everlasting Love.

Perfect for Mother's Day (May 11th) — Ideal for Birthdays and Anniversaries. Extraordinary for those Special Occasions when you just want to express your "Thanks for the Memories."

For most of us the "golden moments" in life are rare — and there are usually certain moments that we remember most — those which we share with someone very special.

Here's a way — a beautiful and thoughtful way — that you can recall and commemorate the Golden Moments you have shared with her — and at the same time, create a *new* golden moment which she'll never forget.

It will happen the moment you present her with your gift of her "GOLDEN MOMENT" Pendant.

This exquisite piece of original jewelry is designed in the form of a miniature Hourglass made of Pure, Solid 18 Karat Gold. And, it uses genuine placer Gold dust to measure time — and each "Golden Moment" that you will share with her in the future. The outer framework of the Pendant is delicately fashioned to the contour of an Hourglass. The actual hourglass, which contains the Gold dust, is mounted on a pivoting Gold yoke and can be easily turned to reverse the flow of gold and start the passage of another new "golden moment."

The Gold dust used in this unique piece of Collector Jewelry is taken from the creek beds and streams located in one of America's oldest and most famous gold mining districts — "Gold Hill" — near Boulder, Colorado. It is slowly and painstakingly "panned" by hand in the very same way that Rocky Mountain prospectors have been collecting gold dust and nuggets ever since the Gold Rush Days in 1849 — for over 130 years.

The Hourglass shape has long been the symbol of eternity. So, a gift of this lovely Hourglass Pendant is a tender way to express your everlasting love. Whenever she wears this unique Pendant, she'll remember those shared "moments" and smile. And, after all — what pleases a woman more than the sentiment expressed with gifts of Gold and Diamonds. Whenever she wears it, it will start conversations — and give her a chance to tell others about the wonderful memories it represents.

RARITY ASSURED — NOT AVAILABLE IN STORES

To assure the rarity, the Limited Edition version of these extraordinary Pendants is being restricted to just 2,500 pieces, worldwide. They are being issued exclusively through our organization, the Limited Editions Collectors Society of America, and are being offered to collectors of fine, handmade jewelry, and to those individuals who are seeking truly unique "Collector Jewelry" pieces for gift-giving.

The design (which is protected by a copyright) was created at the J. T. Inman Goldsmith workshops. Perhaps you have already heard about, or seen, some of the other original creations which have been handmade at Inmans. They are a small "specialty" jewelry model shop, located in Attleboro, Massachusetts, that has been designing and making unique, fine, handcrafted "specialty" jewelry since 1882, serving clients such as Tiffanys, Cartier, Neiman Marcus, Shreves, Halls, and other fine jewelers for many years.

These extraordinary Pendants were created by Inman's designers exclusively for us, for sale to members of the Collectors Society and to other collectors interested in participating in this Limited Edition offer. They will not be sold through retail jewelry stores or department stores, and the *only* way to obtain them is by responding to the Society's advertisement.

A Registered Edition is also available in 14 Karat Solid Gold or Gold Vermeil (Solid Sterling Silver plated with Gold). However, when the Limited Edition is completed and sold out, all dies and molds will be destroyed, and both Editions will be closed forever.

The Registered Edition can also be purchased without a Diamond — at a much lower cost. In fact, you can own one of these remarkable Pendants for as little as $125.00.

Glass contains genuine placer Gold dust
Shown here enlarged: Actual size 1½ inches
Outer Frame and Yoke: 18 Karat or 14 Karat Gold, or Gold Vermeil
10 Point Genuine Diamond

The Hourglass — symbol of Time and Eternity — Fashioned of Pure 18 Karat Gold, Uses Gold dust to Measure the Golden Moments you spend with her.
And, the Gemstone — a Genuine 10 Point Diamond — is Forever.

1,000 pieces of the Limited Edition have already been allocated to fill the orders which are expected as a result of a private offer being sent to the Society's own membership list. This group now numbers in excess of 8,000 serious collectors, nearly half of whom have been subscribers to our previous offers of unique "Collector Jewelry."

The remaining 1,500 pieces in the limited issue are being offered to the general public in advertisements such as this one, which are appearing in a number of national publications that will eventually reach over 10 million affluent readers.

We offer you an opportunity to be among the earliest collectors who will obtain this new Limited Edition piece. It makes a wonderful gift for Mother's Day (for both wives and mothers), anniversaries, plus birthdays and other "special" occasions. It not only makes a unique, charming, and thoughtful gift, but it is one of the finest, and the most *meaningful* that you can ever give when you want to tell someone how much you care about the moments you have shared with her.

AN EXCEPTIONAL VALUE — INDIVIDUALLY HANDCRAFTED

The Pendant is sturdy and solidly constructed, yet it is very comfortable for her to wear. Its sparkling 10 Point, round-cut Diamond is mounted into a deep, firm "setting" to make sure it is secure.

The placer Gold dust is permanently sealed into the pyrex Hourglass and cannot be lost. It will maintain its golden glow for endless moments — forever.

You will be able to tell her that her Pendant has been individually hand-crafted, cast by skilled goldsmiths, and then hand-assembled and polished with the utmost meticulous care. Seventeen separate hand operations are required to assemble each and every Pendant prior to the final inspection by the Master Goldsmith. Every Pendant comes with a 12 Karat Gold-filled Chain, 24" long, which she can easily adjust for casual or dress wear.

Every "Golden Moment" Pendant is an extremely outstanding jewelry value. Many ordinary Pendants — with little to no sentimental meaning — having the same weight content of Gold, cost considerably more. You can verify this by going to any jewelry store to examine the prices of the wide variety of the factory mass-produced pendants that are available. You will find that many of them cost more, and that most cost much more, than the "Golden Moment" Pendant. However, none will have our Pendant's unusual combination of hand-craftsmanship, rare beauty, unique design — or its most important feature — its impressive "sentimental" significance.

There is a simple explanation for this outstanding Pendant value. The Limited Editions Collectors Society makes all of its exclusive offerings *directly to the public.* Its products are not distributed through retail stores, catalog houses, mail-order marketing syndicates, who must add "markup" to the items they purchase for resale.

Because of the very small quantity of Pendants being offered, if you wish to share a new "golden moment" with the special person in your life and commemorate those important golden moments in your past, we strongly recommend that you act promptly by mailing us your order using the coupon below, without delay. Or, better still, to be *sure* that your Pendant is reserved for you, *call us at our toll free number* - 800-225-5252 — to place your reservation before mailing your order.

expect Diamonds or Gold, or Gold dust or Silver to lose their value — they never have.

There is another advantage to this extended one year guarantee. You may acquire your Pendant *now — before the Edition is closed* — and still present it as a gift at a later date — Mother's Day or, an anniversary or birthday that is still many months away or as late as Christmas 1980 or Valentine's Day in 1981.

The Collectors Society is a private organization, founded by a group of avid collectors, art lovers, and historians, including some who have distinguished themselves in the fields of Arts and Letters. In addition to creating and marketing unique and exclusive fine Collector Jewelry, the Society also issues authentic reproductions and replicas of historic artifacts, plus exclusive artworks and official Commemorative products. It has received a number of important awards for excellence and has been commissioned by a number of non-profit organizations, including the Winston Churchill Foundation, the Freedoms Foundation at Valley Forge, the Old North Church Museum, and the John F. Kennedy Library Fund, to create and market their official commemoratives to collectors.

Every collector item issued by the Society is protected with a Certificate of Authenticity signed by the Chairman of the Board of Trustees of the Collectors Society. Your Certificate, showing the serial number of the particular Pendant sent to you (the number recorded in the Society's Master Registry of Ownership and microfilm library), will be sent to you within thirty days after you have received delivery. This protects your investment against inferior imitations or counterfeits and also documents the value of your serially-numbered Pendant for insurance purposes.

The "GOLDEN MOMENT" Pendant is truly a captivating piece of Collector Jewelry and a gift which she is sure to treasure always — one which will assure many more golden moments each time she wears it.

We again stress the fact that only 1,500 are being publicly offered. So, to avoid possible disappointment or needless delay, we strongly suggest that you mail your completed order coupon just as quickly as possible before the small Limited Edition is completely sold. There is also another reason for acting promptly. Due to the volatility of the gold market, we cannot guarantee the prices published here for any longer than thirty days.

So, to make absolutely sure a "Golden Moment" Pendant is held in reserve for you — you should call our Mail Order Service Center — NOW — toll free (at 800-225-5252) prior to mailing your order.

OUR UNPRECEDENTED, EXTENDED GUARANTEE

Every Pendant in both the Limited and the Registered Edition is unconditionally guaranteed. We invite you to examine this unusual and distinctive Collector Jewelry piece, without any obligation whatsoever. Look it over. If you are not completely satisfied, when it arrives, send it back for a full refund. (We'll also reimburse you for whatever it costs for postage and insurance to return it.) Or, even after you have presented this stunning Pendant to that special person, if you find that she is not totally pleased, we will buy it back. In fact, due to the very limited availability of these Pendants, we will be glad to re-purchase yours any time within *one full year* from the date of your order. After all, in the long run, we don't

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☐ GOLD VERMEIL* with 8 point DIAMOND $295.00

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*Gold Vermeil is Solid Sterling Silver electroplated with 24 Karat Gold

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AND CHARGE TO YOUR CREDIT CARD
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Please forward to me _____ *(Quan)* "GOLDEN MOMENT" *Pendant(s) as indicated.*

☐ Payment in full enclosed $ _____

Charge to: ☐ American Express ☐ Master Charge ☐ BankAmericard/Visa ☐ Diners Club

Card Number _____

Valid from _____ to _____

Please add $2 for handling, mailing and insurance for each pendant ordered.

☐ Confirming Telephone Order

Signature _____

Name (Please Print) _____

Address _____

City _____ State _____ Zip _____

† *Ownership certificates showing registration numbers are mailed about 30 days after delivery is completed.*

By Richard M. Restak

Smart machines learn to see, talk, listen, even 'think' for us

New computers with 'artificial intelligence' are reading to the blind and consulting with doctors, even helping to catch criminals

According to a joke making the rounds among computer specialists, a computer programmed for evaluating interplanetary space travel was once asked to assess the chances for success of a proposed manned-space vehicle completing a round-trip voyage between Earth and Venus.

The interrogation, which required several hours to program into the computer, took place, so the story goes, deep within the bowels of the Pentagon and was carried out in the presence of some of the nation's top military advisers. At the completion of the arduous programming procedure the programmer, along with the visiting VIPs, sat back and waited expectantly for the computer's decision. Within seconds the computer responded, "Yes."

The programmer, unsatisfied with such a response to a series of complex and multilayered questions, impatiently retorted, "Yes, what?" to which the computer meekly replied, "Yes, sir!"

The prospects of a computer sophisticated enough to incorporate concepts of military protocol along with specialized knowledge about space flight isn't nearly as ludicrous as this apocryphal tale suggests.

Computers are already capable of playing championship chess, helping to avert airline disasters or prospect for oil; they even conduct some psychotherapy sessions. Each of these is an example of "artificial intelligence" (AI), defined by MIT's Marvin Minsky as "the science of making machines do things that would require intelligence if they were done by men."

And as with any new field, artificial intelligence and computer science research are raising perplexing and troubling questions. Can machines be developed that are smarter than their human creators? Will artificial intelligence make the human brain obsolete?

In rapid and accurate arithmetic calculations, for instance, a $20 hand-held calculator can already outperform the human brain, and there is little likelihood that the brain will ever narrow this gap. So the questions have already been answered in the affirmative, at least in regard to rapid calculation.

But arithmetic is obviously only a tiny part of the human brain's capabilities. Even something as seemingly simple as recognizing a friend's face involves the convergence of thousands of parallel circuits interconnecting in ways that are, so far, impossible in the linear "on-off" system of a computer.

Some recent efforts have attempted to combine the computer's rapid processing time with the brain's superior talent for pattern recognition. One area in which this hybrid approach is proving successful is speech recognition. Experts have long recognized the advantages of a machine that could communicate by voice rather than by the present system which uses a typewriterlike keyboard. Such a system would be more appealing because most people communicate verbally, and it would probably be more efficient.

At IBM's Thomas J. Watson Research Center in Yorktown Heights, New York, I observed a demonstration of automatic speech recognition which could be

Typing by eye, a person simply looks at letters on device called OptoCom, which tracks eye movements and prints out sentences the person has composed.

Photographs by Dan McCoy and Bill Pierce/Rainbow

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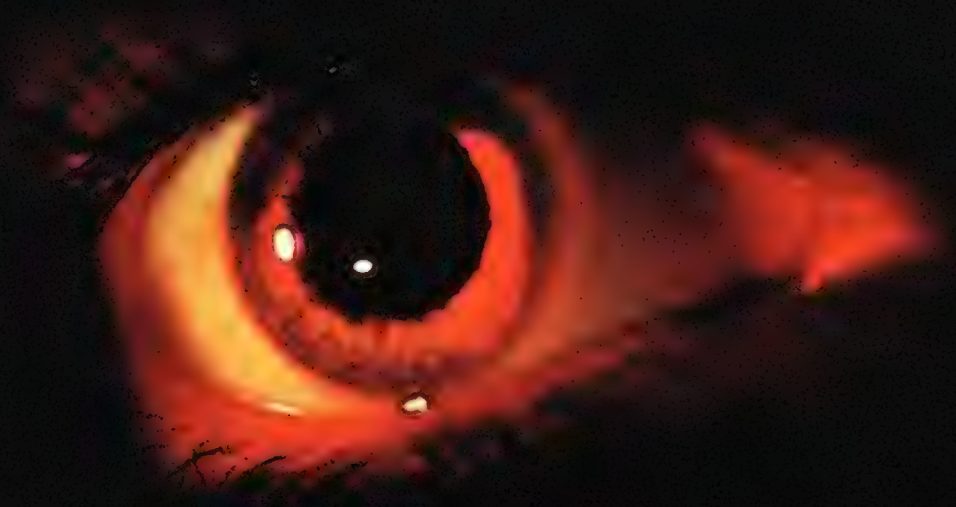
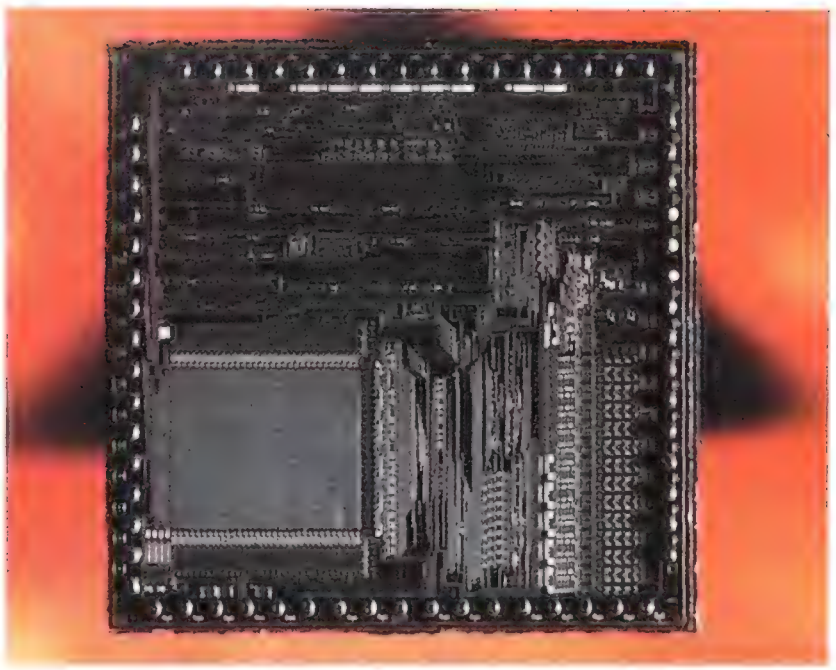


I AM COMMUNICATING WITH THE OPTOCOM
USING EYE FIXATIONS AS THE ONLY
CONTROL MECHANISM.



A computer chip, shown magnified 8.9 times, is the thinking machine's equivalent of human brain cell.

Magnetic tape files at Los Alamos store only some of million-word memory for the fastest U.S. computer.

common in the office of the future. Dr. N. Rex Dixon, one of the principal researchers in IBM's speech-recognition work, started off by speaking the letters of the alphabet and the digits zero through nine into a microphone connected to a computer terminal (p. 53). At this point the speech-recognition device was ready to go. A moment later, after Dixon spoke my name into the microphone, "Richard M. Restak," correctly spelled, appeared on the viewing screen.

Although continuous speech-recognition systems have a long way to go before shorthand and typewriters disappear from offices, scientists at IBM predict that in the not-too-distant future inexpensive speech-recognition machines may be available to take dictation of a letter and produce a first draft within a few seconds.

Just as each person possesses a distinct fingerprint, so, too, individual speech can be analyzed into unique components. This may allow a person to carry out banking transactions someday simply by making a telephone call and talking to the bank's voice verifier, which will have a record of the individual's voice pattern. Some experts are even speculating that if automatic voice verifiers become popular enough, our present reliance on handwritten signatures could give way to a system where we "signed" important documents over the phone.

While some computers are listening to us, others are learning to talk. Computer-driven voice synthesizers are finding dramatic application among the blind and visually handicapped. Kurzweil Computer Products of Cambridge, Massachusetts, has developed a computer capable of reading books aloud. The device is already in use at the Library of Congress. When a book is opened and placed face down on top of a scanner, letters on the page are converted to digital signals that are analyzed by a small computer and transformed into speech by an electronic voice synthesizer. Unlike the monotonous voice of earlier speech synthesizers, the Kurzweil Reading Machine (KRM) can vary the emphasis on particular sounds in a manner similar to natural spoken English. Programmed with 2,500 pronunciation "rules," the KRM (p. 52) is capable of emphasizing some words more than others, and pausing at various times to avoid "machinelike" speech. The KRM controls the synthesizer's sound-producing circuits in much the same way the human brain controls the jaw, tongue and throat muscles in order to shape the vocal tract for the production of human speech.

But using speech obviously depends on more than just acoustical processing. There are rules of grammar and syntax that all of us learn and that presumably could be learned by an intelligent machine. If a five-year-old can carry out a reasonably comprehensible conversation with his mother, why can't a multimillion-dollar computer do as well? An intelligent machine, if it is to understand ordinary language, must be capable of drawing inferences: "I had a headache this morning; before I got relief I had to go to three drugstores." Implicit in this sentence is the speaker's failure to find a headache-relieving medicine in the first two drugstores. But how can a machine draw such a conclusion since it is unable to have a headache and

Dr. Restak, a Washington, D.C., neurologist, is the author of The Brain: The Last Frontier, *published last year, and* Premeditated Man.

has never had the experience of visiting a drugstore?

Scientists at Yale University's Artificial Intelligence Laboratory are developing ways to supply computers with the background they need to draw inferences. According to the laboratory director, Dr. Roger L. Schank, much of human behavior is dependent on people learning large numbers of "scripts," shorthand versions of common everyday activities. By supplying computers with a variety of basic scripts, researchers have already produced intelligent machines with information systems which, although limited to specialized areas, can draw inferences and reach conclusions as intelligently as humans.

A dramatic example is SUMEX, a biomedical resource computer funded by the National Institutes of Health and based at the Stanford Medical School in Stanford, California. Among some 20 AI projects in medicine now linked to SUMEX are the following:

SECS, an AI project at the University of California, Santa Cruz, is now helping chemists design the syntheses of complex biologically important substances. A spinoff of this program predicts possible cancer-causing effects from the metabolism of compounds foreign to the human body, such as pesticides or food dyes and preservatives.

MYCIN, a computer program at the Stanford Medical School, is able to review with a physician the patient's symptoms and then provide suggestions for further testing, diagnosis and treatment. MYCIN can answer questions and, upon request, it can explain its reasoning pattern in order to acquaint the doctor with the basis for coming up with its own suggestions.

Another medical computer project, INTERNIST, at the University of Pittsburgh, aids internists in the solution of complex diagnostic problems. At present, the program deals with nearly 500 diseases and more than 3,000 individual manifestations of disease. While designed for use by physicians, it is also expected to provide help to physicians' assistants in remote rural health clinics, to corpsmen in submarines, maybe even to astronauts on future space missions.

Artificial intelligence processes are also being applied to the study of games such as chess, backgammon and checkers, and, in at least one instance, results have been impressive. A computer program, the brainchild of Dr. Hans Berliner of Carnegie-Mellon University in Pittsburgh, recently defeated the 1979-80 World Backgammon Champion, Paul Magriel, 7-to-1, in a seven-point challenge match. Ironically, the unseated champion was one of the consultants contributing to the development of the victorious program.

The outlook for a counterpart becoming champion in the ethereal realm of international chess is at the moment more controversial.

When chess-playing computer programs were developed in the mid-1950s, enthusiasts confidently predicted that within a decade a computer program would become the world champion. It has yet to appear on the scene despite continually updated predictions of its imminent arrival. This may be due, in part, to the different ways computers and highly skilled human players go about playing the game.

Kurzweil Reading Machine reads books out loud, speaking clearly in voice that simulates human speech.

At any given point in a chess game, the number of possible responses carried out three moves ahead for each side is, for all practical purposes, infinite. With high-speed microelectronic circuits, a chess computer like the one at Bell Labs in Murray Hill, New Jersey, can evaluate some 5,000 positions per second. But for the fastest of modern computers to calculate even ten moves ahead for each side, considering all possibilities, it would take tens of thousands of years.

Skilled human players are highly discriminating in the types of moves they consider. Instead of mentally "trying out" large numbers of potential moves, the superior player concentrates on evaluating a small number of promising ones. The very top players seem to employ highly original, intuitive and idiosyncratic methods of playing which, in many cases, they do not even understand themselves.

Lubomir Kavalek, who is the current reigning American chess champion, guesses that a chess computer costing less than $200 soon will be able to defeat all but the best chess players in the world. "But these people," he says, "I don't think will ever be beaten by a computer."

Although so far checkmated at world championship chess, the accomplishments of AI and computer science in many other fields are already well beyond the most ambitious speculations of a decade ago.

Natural and man-made disasters are now being successfully simulated by computer. During the crisis at Three Mile Island, computers were able within days to estimate the extent of damage to the fuel elements inside the nuclear reactor core, providing urgently needed information. In another recent application, a computer in Boulder, Colorado, aided a 75-member team of specialists in their attempt to predict and control the patterns of oil spillage on the Texas coast from a runaway offshore Mexican oil well.

It takes a computer to catch a crook

In New York City a special police unit, CATCH (Computer-Assisted Terminal Criminal Hunt), is in operation to aid in the rapid identification of criminal suspects. The unit can selectively scan photographs and information on some 250,000 suspects arrested within the past three years. Initially, detectives question a crime victim about 56 descriptive features of the criminal. Answers are then fed into the system which correlates the identified characteristics. Finally, the computer prints out the photographs of the most likely suspects for the purpose of identification (p. 54).

Airline pilots are now able to simulate take off and landing experiences using computer models. While sitting at a set of mock controls, the pilots start with the simulation of everyday flight experiences and then

MAIN MENU
PUSH ENTER TO RUN
November 25,1979
Mr. John Adams
AJAX Software Systems, Inc.
1453 Bread Street
Philadelphia, PA 19103
Dear Mr. Adams:
Thank you for your interest; we at IBM are always anxious to
help in the improvement of computer application.
In response, the Research Division is not the appropriate
source of information concerning product availability.
I advise you to contact:
Mr. John Jackson
IBM Corporation
FSD

At IBM research center, an engineer dictates a sample letter to an experimental speech-recognition system, a forerunner of future office machines. The "menu" at top gives user the computer codes to operate system.

quickly graduate to challenges they rarely encounter in day-to-day routines. A commercial pilot can interact with computer simulations of the behavior of powerful airplanes that travel at supersonic speeds. Or simulations can be devised of airline catastrophes for the purposes of determining alternative, possibly more successful performances. (Computer simulation of the May 25, 1979, Chicago air disaster in which 273 persons died, for instance, revealed that even the most experienced pilots would not have been capable of altering events, given that particular DC-10's structural defects and malfunctions.)

Perhaps one of the more futuristic applications of computer technology comes from the newly emerging discipline of biocybernetics, the linking of brain to machine. Already existing biocybernetic applications include computer-assisted devices that respond to commands as subtle as changes in a person's eye position.

Twin brothers John and James Bertera of the OptoCom Research Group of Hadley, Massachusetts, recently developed a typing system that severely paralyzed or motor-impaired persons can learn to control with their eyes (p. 49). By means of a comfortable eye-tracking system, the immobilized individual stares briefly at the letters on a computer-controlled key display. The process is similar to ordinary typing except in the OptoCom system the measured position of the eye, or where the operator is looking, is substituted for finger and hand movements. The intention to type a particular letter is encoded by the duration of eye fixation. After several hours of practice with the system, volunteers achieved a speed of 18 words per minute of original composition with few errors.

Another biocybernetic advance soon to be available is an automated computer-assisted pen that captures the "dynamics" of individual signatures. Designed by Dr. Hewitt D. Crane of SRI International (formerly the Stanford Research Institute) in Menlo Park, California, the pen measures stress forces in three dimensions which are then converted to electrical signals and stored in the computer. Thus an imposter could not forge a signature by tracing, since, dynamically, the stress patterns in the hands and fingers of someone signing his name could be as unique and identifying as fingerprints.

There are also indications that eye movements can be clues to a person's cognitive and emotional states. For instance, it has been found that a person's eyes tend quickly to latch onto a picture corresponding to a spoken word. Thus, by projecting on a screen an array of different objects, a French teacher could instantaneously test whether or not a student understood *chien* as dog. If he did, his eyes would immediately pass over cats and cows and pigs and home in on the drawing of a dog.

Foreign language learning could be speeded up immeasurably in this way, according to Dr. Roger Cooper, developer of the system and director of the

Center for Eye Movement Applications in Palo Alto. The teacher would not have to ask Johnny whether he knows a word. Johnny's eye movements would automatically give him away.

In the meantime, biocybernetic projects are providing some exciting and potentially useful applications of AI. For instance, later this year the University of London's AI and Robotic Unit at Queen Mary College will begin a series of studies aimed at developing cooperative ventures between machine and human intelligence in manipulating hostile environments. Underwater exploration, planetary investigation and nuclear plant inspection and management will be among the possible applications. But before achieving more complex marvels of biocybernetic communica-

Two New York policemen operate CATCH, computer that "knows" every local criminal arrested since 1976.

Computer's TV-eye view of Pittsburgh is result of experiments in computer vision. In this photograph

tion, scientists first will have to understand a great deal more about how the human brain actually works.

How does the brain extract meaning from a visual scene, for instance? Even simple acts of facial recognition which we all perform routinely involve subtleties of pattern recognition that perhaps no AI device will ever be capable of duplicating.

In addition to difficulties in pattern recognition there are other problems. For one thing, language involves emotional connotations beyond the comprehension of present AI devices. Nevertheless, there are indications that artificial intelligence may yet make contributions to matters of emotional importance.

Researchers at UCLA recently reported on a computer program called PARRY that simulates the linguistic behavior of paranoid patients. This AI effort, using the SUMEX computer at Stanford with terminals in Los Angeles and Irvine, promises to provide a new understanding of paranoid thinking along with more effective ways of treating patients. Other programs have been designed to aid in treating autistic children who traditionally avoid human contact.

In one surprising experiment with this program psychiatrists were free to ask any question except direct inquiries regarding the identity of a "patient." In half the cases the patients were really previously diagnosed paranoids who had volunteered for the experiment. The other 50 percent of the responses came from the "paranoid" computer program. The results: experienced psychiatrists were able to score no better

it sees cityscape on Allegheny River. It is also learning to use map to identify buildings in the city.

Inventor Ray Raymond plays chess with his computer robot. It also plays backgammon, bridge, blackjack.

than at chance level when it came to telling the patient from the computer.

A test to determine whether machines could think was first suggested in 1950 by the British logician and computer pioneer, Alan M. Turing. The former World War II decoding expert was intrigued with the then-revolutionary possibility of a thinking machine. Such a machine would be capable, he speculated, of fooling an interrogator into uncertainty as to whether or not the respondent to a question was a man or a machine. Now the results of the paranoid experiments leave little doubt that AI machines are capable of fooling even the most experienced psychiatrists, at least in the area of paranoia.

But artificial intelligence machines may still have ample cause for modesty. Humans discovered long ago that brains aren't everything, and computers recently learned a similar lesson during a maze-running contest designed for electronic mice. Under the aegis of the Institute of Electrical and Electronics Engineers, the Amazing Micro-Mouse Maze Contest was conceived as a challenge to engineers and computer scientists to design a self-contained maze-solving electronic mouse that could negotiate an unknown maze by use of its own logic and memory. More than 6,000 worldwide entrants registered for the contest, and trial runs were held from coast to coast, leading up to a final race at the National Computer Conference in New York last June.

Engineers came up with an ingenious array of entries which banged, sniffed and learned their way through mazes at the trials, using a variety of sensing devices (from spring-loaded whiskers to "eyes" that could peek over the walls) and battery-operated "brains," or microprocessors. Many of the mice encountered unexpected problems. One of the smarter mice, named Cattywampus, lacked adequate speed control: it simply roared down the opening straightaway, slammed into a wall and got stuck there, unable to negotiate a turn it knew it should make.

In early trials, one of the faster mice was Moonlight Special (opposite). It was equipped with optical sensors and a microcomputer that allowed it to negotiate the maze, learning from its own errors as it went, without ever touching the walls. It was built by six engineers from the Battelle Northwest Research Laboratories in Richland, Washington, out of parts that cost them only $300.

But Moonlight Special was outrun at its debut by a comparative moron, a mouse named Harvey Wallbanger. The creation of three engineers from Hewlett-Packard, Harvey sped through the maze, hugging the right wall at all times as it advanced. Although this was not the shortest route, it required no intelligence and allowed Harvey to make up in speed what it lacked in brains.

Alarmed by the prospect of losing the finals, the Batelle team entered not only a smarter, faster-learning version of their Moonlight Special, but also an optical wall hugger, the Moonlight Flash, with barely any brains at all. Where Harvey groped blindly, the Moonlight Flash had eyes which gave it a slight edge. When the finals were over, the Battelle team had won, but artificial intelligence had taken something of a beating. It was their dumb mouse that came in first.

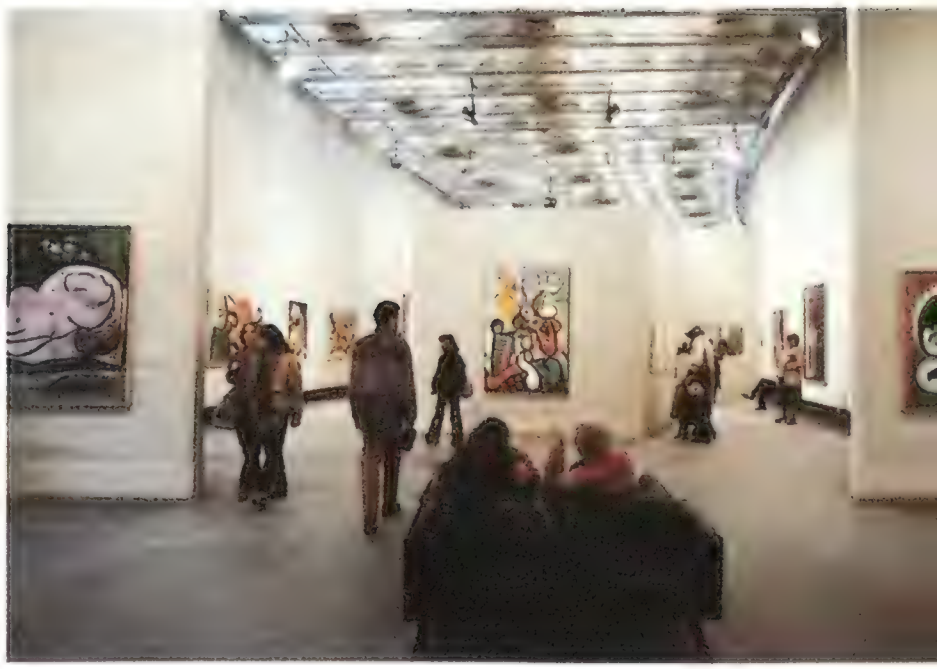
Smart micro-mouse Moonlight Special tries out a maze, as three of its builders—from the left, Phil Stover, Art Boland, Ron Dilbeck—await results.

Moonlight Special, seen here with its circuitry superimposed, was named for the 500 hours of "moonlighting" time engineers spent on it.

All paintings © S.P.A.D.E.M., Paris/V.A.G.A., New York

By Pierre Schneider

A revealing look at the Master's private collection



A gallery view of first public exhibition of the newly gained Picassos at Paris' Grand Palais.

New legislation made France heir to a superb selection of Pablo Picasso's work, now on view in Minneapolis and coming to New York

The Walker Art Center in Minneapolis is presenting a selection of works from the Picasso retrospective which, from mid-October to mid-January, attracted crowds so large they encircled the Grand Palais in Paris. This mammoth exhibition was unique in that its contents belonged entirely to one institution: the new Musée Picasso, a French museum that is still without its own building.

It is the largest and richest collection of Picasso's art in the world, a fresh look at the work of a master of which one thought there was nothing left to say: 228 paintings, 149 sculptures, 85 ceramics, 1,495 drawings, 33 sketchbooks, 1,622 prints (including 111 monotypes), 35 illustrated books, not to forget a wealth of documentary material and some 30 other works by the artist's friends and from Africa.

The Walker Art Center's exhibition contains 160 paintings, sculptures, collages and drawings from the Picasso legacy as well as 100 etchings. Later in the year, beginning May 22 and running through September 16, New York's Museum of Modern Art will mount a Picasso show, also drawing heavily on the legacy, which will be the biggest it has ever given to one artist in its 50 years of existence. The entire museum will be devoted to the showing.

Picasso painted *The Two Brothers* in 1906, in the period when he was entranced with red-ochre nudes.

It took the Museum of Modern Art in New York half a century of patient effort to acquire its outstanding Picasso collection; but a few weeks before the Grand Palais show opened, the Musée Picasso simply did not exist. Until 1947, France's museums boasted only one picture by the Catalan master. Ten paintings were donated to the newly founded Musée d'Art Moderne by Picasso himself in that year. France's first purchase of a painting by Picasso, who arrived in France in 1901, occurred in 1950. By then, it seemed too late—*i.e.*, too expensive—to make up for lost time.

It *was* too late, until, at the suggestion of André Malraux, an ingenious law was passed giving the state an opportunity to make up post mortem for the lack of interest it has unfailingly shown to major artists during their lifetimes: it stipulates that one may pay one's inheritance taxes with works of art, provided they are sufficiently important for the state to agree to the transaction. Passed in 1968, this law enabled French museums to harvest masterpieces by Rubens, Fragonard, Cézanne, and so on. But the most impressive proof of its efficiency so far is the Picasso collection.

The Spanish artist died in 1973, leaving his estate to his wife Jacqueline and his son Paulo. Then, in 1974, the three children he had had out of wedlock were found by a court also to have rights as heirs. It took more than two years to inventory the estate, for Picasso loathed parting with anything. And so works of art but also odds and ends were heaped together in indescribable disorder. When a room was cluttered to the brim, Picasso did not clean it: he closed it and moved on to another.

The inventory disclosed an almost incredible art trove: Picasso had kept 1,876 paintings, 7,249 draw-

Photographs by Dmitri Kessel

In 1901 Picasso painted *The Death of Casagemas,* a painting which led to his famous Blue Period.

Influence of African art is clear in *Mother and Child,* 1907, but intent was also to deny prettiness.

ings, 1,335 sculptures, 2,880 ceramics, more than 30,000 prints, as well as many copies of all his illustrated books and 149 sketchbooks. It was into this artistic Niagara that Dominique Bozo, the director of the forthcoming Musée Picasso, in collaboration with Jean Leymarie, longtime friend and connoisseur of the late Spanish master, plunged to make their choice. The success of this colossal task, which took another two years, is due to two circumstances: the sustained quality of the works Picasso had kept and the fact that, contrary to the stipulation of the law, the heirs allowed the state first pick. As a result, M. Bozo was able to rope in complete sequences of works and to illustrate the artist's development, in all media, with a maximum of coherence and continuity.

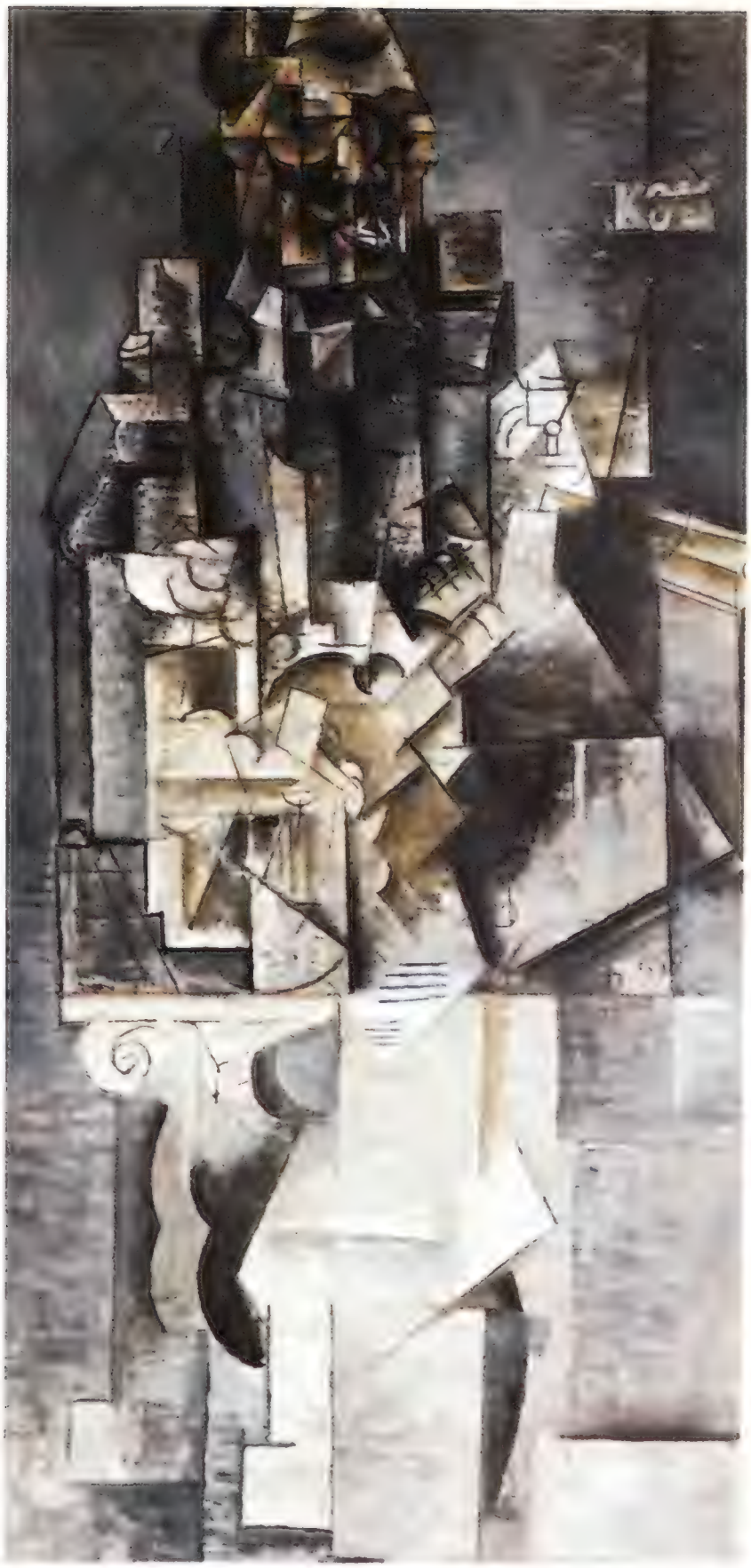
The full impact of the collection will not be felt until 1981, when it will move into its permanent quarters, a handsome 17th-century mansion known as the Hôtel Salé. But already it is obvious that our image of Picasso will be transformed notably.

The care and coherence of Picasso's working methods seem incompatible with the inconsistency, the inexplicably arbitrary changes of direction, often ascribed to his artistic itinerary. But the Musée Picasso provides us with the answer to this puzzle: it was not he who showed himself inconsistent, but we who did not possess all the facts. Most spectacular, in this respect, is Picasso's sculpture, insufficiently known until 1957. Yet trying to understand Picasso's oeuvre without his sculpture is like trying to decipher a language whose consonants are missing.

The Musée Picasso begins where the Picasso Museum in Barcelona leaves off: with his arrival in Paris in 1901. The young artist who arrived in the French capital was not a provincial unaware of modernism: he was already the visual glutton who took in life and art with unblinking voracity. Barcelona, too, was a capital of avant-garde art. However, whereas the Parisian avant-garde was concerned primarily with the visible world and with formal problems, Barcelona, like Munich, Vienna and London, explored the invisible, the symbolic, the psychic. Picasso's "Blue Period" was part of the nocturnal fin-de-siècle mood prevailing in much of Europe. But for him it was not just fashion: misery, sadness were things he knew intimately. "It was while thinking about Casagemas"—the friend who had committed suicide and whose portrait on his deathbed (left, above) is one of the Musée's revelations—"that I began to paint in blue."

The emotional charge in these works seemed excessive even to Picasso's Catalan contemporaries. "The

An American living in France, the writer is art critic for L'Express, *has written books on Watteau, Poussin, Manet, and is writing one on Matisse.*



At height of his Cubist period, in 1919 Picasso painted realistic *Still Life With Pitcher and Apples.*

A key example of Picasso's Analytical Cubist work is *Man with Guitar,* painted in Paris, 1911-13.

artists here," he wrote to his friend, the poet Max Jacob, "find that there is too much soul in my work and not enough form. Very funny." He was soon to agree with them. In 1904, under the combined influence of the beautiful Fernande Olivier and the positive-minded French tradition, his work changed: "pink" succeeded "blue" and bodily form and performance (by dancers, acrobats, clowns) replaced soulful expression. Only one work—but it is a masterpiece —bears witness to this transformation: *The Two Brothers* (p. 58), a perfect example of the passing synthesis between French and Catalan modernism.

This fragile equilibrium could not last. By 1905, Picasso was turning to radically new sources of inspiration. Among these, Gauguin was foremost. Gauguin's example spurred his interest in archaic and primitive art, as well as in sculpture. Primitive art answered a nostalgia for lost paradise exacerbated by the growth of industrial civilization around 1900. Sculpture, too, represented for the painter a lost paradise, for at a time when modern painting was gradually, inexorably becoming flat, sculpture still had access to the third dimension. Henceforth, Picasso would turn—"blissfully," as he once told sculptor Julio González—to making sculpture whenever he felt the need to escape from the flatness of the modern picture.

The intensely experimental years between 1905 and 1908 constitute one of the highlights of both the art-

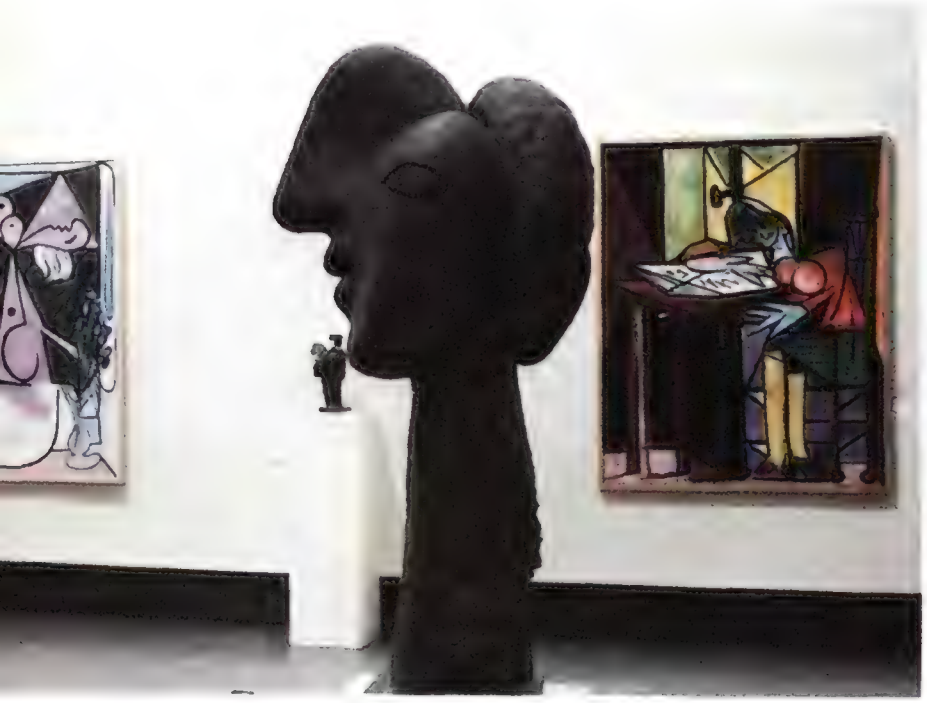
ist's career and the museum. To be sure, the major picture of the period, *Les Demoiselles d'Avignon,* in the collection of New York's Museum of Modern Art, is missing, but the numerous studies on paper or canvas that preceded, accompanied and followed it have an eruptive freshness, a violence which the *Demoiselles* harnesses, and which point to a fact that historians have chosen to ignore: Picasso's preoccupation with African art was not purely formalistic. He was also entranced by the religious meaning it conveyed. For a year or so, he seemed possessed by a savage god.

The episode was as brief as it was intense. By 1908, strictly esthetic concerns once again prevailed. In part, this may have been due to the influence on Picasso of his new friend, the reasonable, moderate, typically French Georges Braque, but also to the fact that burning bushes never burn very long. In any case, Picasso and Braque now embarked upon the "methodical adventure," as poet Pierre Reverdy called it, known as Cubism. Its early years are illustrated only fragmentarily in the museum's collections (except for drawings), but the culminating moment of Analytical Cubism—1911—is superbly represented by two large canvases, the famous *Man with Mandolin* and the newly discovered *Man with Guitar* (p. 61).

They are enough to make the change of mood and of interests clear. Picasso now ties himself firmly to the tradition of French modernism. He rejects dramatic content—"soul"—in favor of form: "A pictorial idea will be pure," he writes in one of the unpublished notebooks in the Musée's collection, "only if one can express it in no other language than that of painting."

Borrowing Cézanne's facets, Picasso and Braque multiplied them until subject matter literally dissolved in space and figure became undistinguishable from ground. Every picture thus came to be, as Picasso later said, "a sum of destructions." To prevent objects from becoming unidentifiable, Picasso peppered his canvases with realistic clues: here a moustache, there an elbow or the curve of a guitar's belly. By 1912, the two friends were making images that at once coincided with the picture plane and were unrecognizable: both space and the objects in it had been eliminated.

It could have been the end of the Cubist adventure—



Picasso's sculpture was as forceful as his painting. In foreground is his *Head of a Woman,* 1932.

The group title for these singular pieces cast in bronze is *The Bathers,* sculpted in Cannes, 1956.

indeed, Mondrian now took the step into abstraction. Picasso and Braque, however, refused to take it. Instead, they set out on a new, still more radical course. This second phase of Cubism was based on a brilliant insight: the object, which had been analyzed into its component parts, could no longer be put together for identification by the eye, but it could be reassembled by the mind.

Now that identifying the image was a mental operation, colors, lines, textures were freed from the obligations of make-believe. They could stand for themselves. The Musée Picasso is undoubtedly the only place to cover this extraordinary development completely. Nowhere else can one assess more clearly the double revolution that it brought about.

A time for change

The first, concerning art as a whole, is the abolishment of the rigid, preordained frontiers which, up to that time, separated art from what wasn't art. Anything, henceforth, no matter how commonplace or even industrial, could become art. The second specifically concerned sculpture: until Picasso came along, sculpture had been a matter of modeling or carving, of building up or whittling down a solid mass; now, it became the product of construction, of assembling open, transparent elements. Space, which only surrounded sculpture, now could be surrounded by it.

Picasso entered the First World War dressed in denim; he emerged from it in a tuxedo. The change in his work was no less startling: Cubism had given way to—or at least made room for—realism and classicism. To his friends and admirers, the change seemed like a betrayal, which they attributed to his new style of life—designing sets for Diaghilev, beautiful women, *la vie parisienne*. Actually, however, this apparent "betrayal," which cast upon the experimental prewar work a suspicion from which Picasso never recovered completely, is the strictly logical consequence of the Cubist adventure. By 1914, the latter was over: the artist, at last liberated from all obligations toward the model and space, was sole master of his picture. But for that freedom he had to pay a heavy price. The picture now was reduced to its surface, and surfaces only allow superficiality. The only way to continue working was to play.

And that was precisely what the Ballets Russes, in 1917, allowed Picasso to do. Diaghilev thus provided Picasso with a new raison d'être. There are some 400 drawings relating to Picasso's ballet sets and costumes in the collections of the museum. Their very variety provides the key to the eclecticism of his production during the next few years, for what they tell us is that everything was permitted because nothing had weight.

Flowingly designed, light as air, free-standing *Football Player,* 1961, is of cut-and-painted canvas.

Exploring collage and Cubism in different forms is *Construction: Guitar and Bottle of Bass,* 1913.

A tour de force of massive complexity demonstrates Picasso's mastery of color, design, topical

The museum is richly endowed with works illustrating the diversity of styles marking the period 1918-1924.

It is through this very eclecticism that Picasso shows himself truthful and timely. The poignantly exaggerated roundness of the giants Picasso painted around 1920-1923 betrays a nostalgia for the lost paradise of weight and volume. Cubism had illustrated the crisis of Western art; post-Cubist painting, as Picasso practiced it, illustrated the crisis of Western civilization. Picasso's figures, in these years, frequently wear masks

Classically composed major work, *Reading the Letter,* 1921, was unknown to the world before bequest.

reference and singularity of mind. It is *Bullfight: The Death of the Toreador,* done in Boisgeloup in 1933.

and disguises, as if to remind us that paint is no more than a mask disguising the absence of a face.

The choice, now, was between mask or void. Briefly, in particular in the astonishing sketchbook of 1924, Picasso chose the void: in these magnificent pen drawings, elegance turns abstract anarchy into order. But Picasso closed that pad, as if it were a door opening onto some unbearable sight. Henceforth, he was to prefer masks.

If masks are to be alive, they must have a content—they must be worn. Picasso's solution was to wear the masks himself. His own life would henceforth provide his painting with its content. "The work one creates," he said, "is a way of keeping one's journal." He now tended to date his pictures and drawings by the day.

Picasso liked costume dress, here employed in self-portrait, *Old Man With Hat, Seated,* 1970-71.

Masks draw out the obscure forces buried deep within those who wear them: Picasso's images now open themselves to the dictates of the instincts, of the subconscious. With *The Kiss,* the ferocity, the excessiveness which Picasso had repressed in his work since 1908 burst forth again. The *Guitars* of 1926 are no longer instruments of Cubist harmony but of psychological aggression. The flotsam and jetsam of dreams fill the extraordinary boxes of 1930. Bathers, models, still lifes are submitted by dreams to tragicomic distortions and metamorphoses: flesh is petrified, inorganic matter behaves like humans.

As these images seem to be torn between the angular and the undulant, so they are the battlefield between the forces of attraction and of repulsion, violence and tenderness, love and death. Freud's theories were just then becoming popular with the French intelligentsia, especially with the Surrealists. Not surprisingly, Picasso now linked up with them.

In one significant way, however, Picasso differed from the Surrealists. For them, art was merely a means to transgress ordinary reality: what really mattered was the life beyond. For Picasso, on the other hand, art always remained the end. "One must tear up reality," he once told Françoise Gilot: reality, not paint-

ing. For it is the masks that count, and not the wearer.

The rise of Fascism was to provide dramatic illustration of Picasso's creative priorities. Suddenly, the monsters risen from his subconscious could be given a name: Franco, Hitler. . . . Private, personal dream turned into collective, historic nightmare. *Guernica* (1937), the climactic work of this period, simply restated in public terms the intimate themes of the previous years. *Guernica* is of course absent from the collections of the Musée Picasso, but, as in the case of the *Demoiselles,* the concurrent work, in particular the tragic portraits of Dora Maar which are among the towering achievements of his career, is splendidly represented. (*Guernica,* on extended loan to the Museum of Modern Art since September 1939, is scheduled to arrive in Spain, to which it belongs, in 1981, the centennial of the painter's birth.)

"I have never been able to see, to imagine her otherwise than in tears," Picasso said of Dora Maar. She was, in short, ideally suited to embody the anguish of the times. But the "somatic dislocation," as William Rubin aptly puts it, to which her likeness is subjected and which so admirably expresses the tortures which men now inflicted on other men, was a purely artistic process: it had preceded Dora Maar's advent (indeed, it had begun with Cubism) and was to continue after her departure. Picasso never invented a language to suit the hour, but with unfailing flair he invariably selected, in the immense range of his vocabulary of forms, those which were the best suited to the spirit of the times.

To some extent, it was also, as often in the case of genius, a matter of luck. Mourning had always become Picasso (one of his earliest critics, Charles Morice, had described him as a "young god who never smiles"). World War II and the occupation of France provided the gloomy context that lent added meaning to his sharp, austere still lifes of the 1940s. But no matter how directly he experienced horror or indignation, Picasso could only give it indirect expression. Painting made him say what *it* wanted, not what *he* wanted.

He tried to free himself from its grip. In 1944 he joined the Communist Party: politics provided an escape from art. He also indulged in the antics that contributed so much to the myth of the playboy of painting. The museum does not emphasize his painting done during this ten-year-long interlude (the sculpture, on the other hand, whose inventiveness does not sag, is well represented).

The last years are a different, deeply moving story. Retired from the turmoil of the world, Picasso remained alone with painting. And painting henceforth refused to deal with anything but itself. Picasso's chief works of the period are variations on pictures by Courbet, Velázquez, Delacroix, Poussin, Manet. References to the outside world almost disappear: painting has trapped Picasso. Sometimes he lashes at it with desperate rage. More often, the affair is one of love, for painting is the only reality left to him; his brushwork, in these final years, is more explicit, more savory. Like the action painters who had just triumphed on the art scene, Picasso now relied chiefly on swiftness of gesture, reflecting the accelerated, unstoppable time of old age. This acceleration accounts for his prodigious output in the late Sixties and early Seventies.

Moreover, the haste, the breathlessness, is woven into the very fabric of every picture. To stop painting would be to stop living. In the solitude of his studio, Picasso now surrenders completely to the tyranny of painting. One may view the latter as an encyclopedic repertory theater in which he must play all the parts, wear all the costumes and masks, move all the sets. He is a musketeer, Rembrandt, a Spanish grandee, a clown, El Greco, a bullfighter. The changes of costume must be made so fast that sometimes gowns are torn, a wig is set askew. There is no time for corrections. Never has the anguish of the race against time been rendered more startlingly. "One must outstrip the motion to stop the image," he said. "Otherwise, you keep running after it."

But the images now were flitting by too fast to be caught up with. And there were too many of them: the entire history of painting now raced past his eyes, like memories in a dying man's mind. He recorded them, blurred by speed, in hundreds. When he died in 1973 at the age of 92, it was as if easel painting had come to an end.

An evocation, in the style of Seurat, of a classic master: *The Peasants' Repast, after Le Nain,* 1917-18.

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Sparse, open rangeland of McCone County, Montana, boasts population of about one person per square

By Michael Parfit

A gathering storm over synfuels on the Big Sky range

The plan to build a coal liquefaction plant in Montana stirs up a battle over whether land should be used for agriculture or mining

mile, three-month growing season, annual snowfall of 30 inches, temperatures from -57 to 110 degrees F.

Photographs by Michael Parfit and Harley F. Hettick

The town of Circle, seat of McCone County, Montana, lay open on the prairie, embraced by the frozen curves of the Redwater River, innocent. On Main Street there was a light on in Chapin Drug, but across the street the barber shop, operated by a man who drives 100 miles twice a week to cut hair here, was dark. A few cars were still parked outside the Super Valu market, the biggest store in town; a gust of northwest wind, as accepted here as cow manure and annual tractor payments, unfurled a long streamer of dust down Main Street and swayed the caution light that hangs across the intersection of Main and State Highway 200. The light was out of order. There was no traffic, anyway. At the northeast end of town at the Travelers Inn, a loaded cattle truck was parked, its diesel muttering, its cargo groaning. Over beside the Burlington Northern railroad tracks the two grain elevators rose into the clean twilight, their corrugated sides gleam-

Synfuel 'battlefield' in eastern Montana

Named for brand used by cattle ranch once located on this site, Circle, with a population of 964,

ing. Under their benevolent, upright promise of security, the 964 citizens of Circle awaited nightfall.

But down in the basement of the Vets' Club on Main Street, in a low-ceilinged room into which drifted laughter from the bar upstairs, about 20 people were gathered around a long table, talking quietly. In the group were several individuals who, not entirely to their dismay, have recently become notorious around here—Helen Waller, bold and authoritative; Charlie Yarger, who takes a nickname from a fictional saboteur; Tom Breitbach, the man who knows about the manufacture of alcohol; Lyle Quick, a county commissioner; and John Brown, a maverick farmer with disdain for both chemicals and debt.

The meeting was sober and unemotional. No voices from here would penetrate to the floor above to disturb the cheerful drinkers. But the people here were not discussing the school district mill levy or the maintenance of county roads. This group, the McCone Agricultural Protection Organization, was tonight planning its fight against a key element of American energy policy, the manufacture of synthetic fuels.

McCone County seems an unlikely hotbed of revolt. Its 2,652 square miles are populated by fewer than 3,000 people, most of whom like their fellowmen best a few miles away. "The low population," the county agricultural extension agent said once, "is why a lot of people live here." But the rolling, grass-covered hills of McCone County hide more than two billion minable tons of the estimated one-and-a-half-trillion tons of coal contained in the Fort Union Formation, which extends from North and South Dakota through Montana and Wyoming and into Colorado. This mass of coal and rock, stacked in subterranean layers across the West like a huge energy cake, was among the resources President Jimmy Carter had in mind when, in July 1979, he proposed a program to replace some of the nation's imported oil with synthetic fuels made from substances such as coal and oil shale. Producing enough fuel through so-far underexplored technologies, he indicated, would require a warlike effort. "On the battlefields of energy," he said, "this democracy which we love is going to make its stand." And after they learned that a U.S. Department of Energy report had recently suggested that ten counties in Montana, including McCone, could support up to 36 huge synthetic fuel plants of the kind the President proposed, the members of the McCone Organization felt that one of the battlefields he had mentioned might be right here at home.

"I read with disbelief the announcement that McCone County had been targeted for synfuel plants," Helen Waller said much later. "It's not that I didn't believe the feds are capable of such a misguided plot, but rather that I am not convinced that farmers and ranchers in the area would allow them to pull it off. This is an agricultural community, and we have drawn the line."

There are 48 family memberships in the McCone Organization, representing perhaps 200 men, women and children. Helen Waller is a past chairwoman and a continuing voice of determination. She lives, with her husband, Gordon, and two youngest children, in a small, metal-sided house about 19 miles out of Circle. The road to her home turns to rough gravel just outside town, then rolls northwest through enormous strip-farmed grainfields that lie across the county like

Michael Parfit wrote on Puget Sound salmon war in the February 1979 SMITHSONIAN. *His forthcoming book,* Last Stand at Rosebud Creek, *is on energy.*

is largest town in McCone County. Only other two towns have combined population of less than 100.

Using cattle ranch kitchen as an office, Helen Waller prepares testimony in opposition to synfuel plant.

gently rippled flags. It crosses narrow pools of water where creeks pause for the dry months, on their way north to the Missouri; it skirts pastures that sweep off to horizons faintly marked by the scrawl of fence; and very occasionally it draws past a clump of buildings sheltered from the northwest wind by a crescent of cherished trees. The dust blown up by an occasional passing pickup truck is borne away on the wind and dissolved in its immensity. The winter air that rushes past the Waller home on a knoll a mile off the road is as clear and cold as polar ice.

Helen Waller is a brisk, cheerful, efficient grandmother, 46 years old, who wears blue-tinted glasses and short blonde hair and likes to use punchy Western rhetoric, particularly when giving testimony at local hearings or before legislators. "I just let 'em have it," she said. "I lay it out right straight."

"It's the pollution of these conversion plants that bothers me," she said. "I read in a state health department report that there could be a 15 percent weight loss in winter wheat with even small increases in sulfur dioxide pollution. That tells me we're completely wiped out." Wheat's quality is measured largely in weight per bushel; light wheat might not be worth growing. "But the politicians don't realize the West isn't as spineless as they wish it was," she said. "It isn't going to be as easy to put plants in McCone County as they think."

Burlington Northern, Inc., a railroad-based company which ranks high in *Fortune* magazine's list of the 50 top U.S. transportation companies and which is the leading coal hauler in the nation, knows that it is not an empty threat. In the middle of a pasture about ten miles southwest of the Wallers' house is the evidence. Here, protected from the surrounding vastness by a woven wire fence, is a tiny plot of land that looks like an old Western cemetery, one of those odd little burial grounds that lie, treeless, on the prairie or in the middle of wheat fields. In the center of the plot is a large depression, an area perhaps 25 feet wide and 40 feet long, where the ground has recently sunk about five feet, leaving cracks in the earth around its edge.

But nothing is buried here. This is, in fact, the first footprint made by synthetic fuel development in Montana. In 1975, Burlington Northern mined about 20 tons of McCone County's abundant brown-black lignite coal here, filled the pit back in, and sent the coal to laboratories for analysis and testing, to see if it could fuel a plant the railroad had recently proposed. In grandness of scope, the proposed facility was similar to the huge coal-fired electrical generators already being built on the Fort Union Formation at places like Gillette, Wyoming, and Colstrip, Montana, turning small communities into boomtowns. The plant would cover more than a hundred acres near the first small mine with a structure combining the towering filigree of an oil refinery and the dense mass of a power plant; in its final stage it would liquefy coal to produce about 30,000 barrels of diesel fuel per day.

"Burlington Northern was really going to cut a swath," Helen Waller remembered. But by the time the reports on the coal came back to the company, the McCone Agricultural Protection Organization was ready to oppose the facility, and Burlington Northern paused. Although the company blames problems with acquiring water and economic conditions for its delay, some of the blame or credit must go to the organization. Its members repeatedly journeyed to Helena, 400

Tossing bale down from the haystack, maverick farmer John Brown helps a neighbor with chores.

Charlie Yarger feeds some of 300 sheep that share ranch with 150 cows, several thousand hogs.

miles away, conferring with more than half the state's 150 legislators. Its lobbying has contributed to, among other things, improved land reclamation laws and regulations, and the preservation of Montana's remarkably durable 30-percent coal tax, which built obstacles for the Burlington Northern project. One of the organization's principal achievements was to help include synthetic fuel plants in Montana's strict Major Facility Siting Act, an act which requires extensive public participation and a 600-day study of any major proposal. A kind of wall around the state's resources, it sets up a barrier of delay, expense, contemplation and legal procedure that can only be surmounted by the most determined developer.

The organization has also lobbied for federal legislation. One of the rewards of that effort now seems ironic: at 9:15 A.M., on August 3, 1977, Helen Waller and her husband stood in the White House Rose Garden and applauded as President Carter signed the Surface Mining Control and Reclamation Act, a landmark that was one of the reasons Carter had earned a good rating from environmentalists.

Less than two years later, Mrs. Waller sat in her daughter's trailer watching television with dismay as Carter outlined an energy policy which included $88 billion to produce about 2.5 million barrels of synthetic fuel a day by 1990, and promised special attention to speed—projects would be accelerated by an Energy Mobilization Board, designed to "slash through red tape."

"Strange cats in the same bag"

So, instead of fighting one large company, the organization is now up against a national effort. But Helen Waller is undaunted. "We've fought some terrible odds and come out on top before," she said.

The meeting she had attended in the basement of the Vets' Club a few days before was, in fact, aimed at organizing testimony for an upcoming hearing by the Bureau of Land Management (BLM) on a plan that proposed further consideration for leasing federal coal, including nearly two billion tons under 81,017 acres of mostly privately owned land near Circle.

Helen Waller calls herself a conservative Republican. Charlie Yarger, who farms nearby, reluctantly admits to liberal Democratic inclinations. The pair are proof of one of Mrs. Waller's characteristically striking images: "These issues," she said, "really throw strange cats in the same bag."

On a gray afternoon not long before the BLM hearing, Yarger was outside his house, welding chains and savoring Copenhagen snuff. He is burly, bearded and 31 years old. His Ford pickup bears the personalized license plate "HAYDUKE," the name of a charac-

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Tom Breitbach calls his 4,000-acre ranch "a small operation in this country."

Spotting pickup that brings baled hay each day, Breitbach's cattle beat a path to their meal.

ter in Edward Abbey's novel, *The Monkey Wrench Gang,* who delights in sabotaging bulldozers, dams, mining equipment and anything else that could harm the environment. But Yarger is not the organization's demolition specialist. He has other roles. He articulates what is probably the group's central fear—invasion; that even one synthetic fuel plant will ruin the county's wide, crimeless, open way of life.

"I truly love my work, what I am doing," he said. "That's hard for some people to understand. I live 15 miles from town and I'm the second place on the left. It ought to be reason enough for us not to destroy the last place on Earth where you can have this freedom to be isolated." He leaped into the pickup and drove enthusiastically over rutted roads to a low hilltop where he got out and stared off into wind and blowing snow and tried unsuccessfully to point out the rim of the Missouri Breaks. Below the hill a creek lay in the bottom of a broad valley, weaving its bright, frozen strands through miles and miles of grassland populated solely by three bay horses. "That's Stoney Butte Creek," he said. "My best land. It's also the flattest, most direct route between Burlington Northern's main line and where it wants to put the plant and the strip mine." He spat tobacco juice on the hilltop. "I've been tagged a liberal damn kid," he said, "but what I've been fighting for are some of the most basic right-wing issues—property rights, landowner rights, states' rights."

Back at his home, Yarger washed the tobacco out of his mouth with the kitchen sink sprayer. Thus prepared, he sat down at the table and consumed most of a T-bone steak that looked just under an acre in size, final gift of a steer named Dumbo, whose vast red hide lay rolled up on the porch. Then he packed his lower lip again, grabbed an empty beer bottle in which to deposit the residue, and became subdued.

"The winters around here get to 40 below," he said. "And the wind's always blowing 30 miles an hour. It's not the most hospitable country. We love it. Maybe that's what's made us so tough, given us the stick-to-itiveness. Our attitude here is that we're not just going to stay in this battle until the bitter end; we're going to stay until we *win.* You make that commitment."

Yarger worked that evening on his testimony for the upcoming BLM hearing. Remarkably, the thought of driving 50 miles to blast absent bureaucrats through a court reporter's passionless fingers seemed to stir in him the same kind of joy that the thought of blowing up Glen Canyon Dam stirred in his fictional friend Hayduke. Yarger grinned widely when he considered it. "I love trashin' the BLM," he said.

Some of Yarger's cheerful confidence no doubt dates back to a blizzard that swept McCone County in February 1978. For five days Yarger, his family and nine key members of the staff and leadership of a group called the Northern Plains Resource Council were trapped by drifts in Yarger's small home. The Resource Council is the independent coordinating arm of an alliance among 14 groups like the McCone Organization from all over Montana; its staff provides technical expertise and legal aid. During their confinement, the Yargers and Resource Council members refined strategy, tried to dig themselves out and, when that failed, toughened their mental attitudes with a game called *Spoons,* in which the players fight, sometimes with bloody results, over silverware. Yarger must have realized, when it was over, that a group that could survive those stresses could tackle anything.

Shortly before the BLM hearing, Yarger traveled to

At Lyle Quick's place, sheep eat home-grown feed that chuck wagon has spread in a large circle.

Quick, like many Montana ranchers, raises both livestock and grains.

the Resource Council's annual meeting, held in the old cattle town of Miles City, about 100 miles south of Circle. Among the issues he and other members tackled there was the administration's proposed Energy Mobilization Board. This appointed board may have power to override both procedure and substance of federal law and procedure alone of state law in order to slip vital energy projects through the maze of legal delays that have held up so many proposals like Burlington Northern's plant for years.

To the assembled Resource Council members these powers seemed aimed directly at the Montana Major Facility Siting Act. Although no one at the meeting would publicly promote bureaucratic excess, it was clear that one man's tangle of red tape may be another's skein of justice; the council members believed that the structure of debate and caution they had built around their state's coal was legitimate. In attacking the board, Lyle Quick, a McCone County Commissioner, drew one of the few bursts of laughter in a sober day. Without procedure, he observed, there would be very little substance to making love.

Later, out on his land near Circle, Quick settled back into a tiny trailer house at the collection of sheds and corrals he calls his winter camp. He's a sheep rancher, whose innocent eyes are surrounded by worldly wrinkles. The louvered windows of the trailer were chinked with Wonder Bread wrappers to keep out the wind, which instead came through the door. "My biggest concern," he said, "is probably the social part of synthetic fuel development. The thing I value most about this country is we don't have a people problem." (Last year's jail boarding expenses were $2.75.)

There are some residents of Circle, however, who don't seem to care whether crime comes or not, as long as industry comes with it. "Sure there's going to be more crime," said Leonard Kuntz, owner of a Circle gas station. "And you'll need more police force and all that, but I don't see anything wrong with that if the town's going to stay here." Kuntz said he had invested in a self-service pump at the other end of town in anticipation of a boom that has not yet arrived. Is he hurting?

"Myself, I'm not having that much of a problem," he said. "But you've got to look for improvement; you can't be satisfied with what you've got."

John Brown, an organization member, might agree, but not in a material sense. Brown, too, is always looking for improvement, but to him it sometimes means being satisfied with less. A tall, slender farmer of 32, Brown is one of the county's true nonconformists: he was a conscientious objector during the Vietnam war; he farms organically, carefully contour-plowing his fields in defiance of strip-farming convention; he has a large, solar-heated greenhouse with pumps powered by electricity generated by McCone County's abundant wind; he has no television set and no running water. Most remarkably, in farming country, he runs his farm free of debt.

In a way he is the organization's philosopher. Certainly he explores options that may not occur to others, with a wide-ranging but careful mind. Although the organization's tactics seem hardly revolutionary, consisting mostly of attention to the detail of issues, Brown had recently been discussing something called "ecotage" with a Minnesota group that advocated occasional damage of power lines and towers. Should that be a choice of the organization if all else failed?

"I suppose it's something that has to be considered," he said. "But if you do it on a whim, it's vandalism,

and if you make up your mind to do it, what it looks like to me is there is no end to it, once you start."

Although there is no dynamite in organization members' basements, there may soon be stills in their backyards. Part of the group's strategy for opposing the manufacture of synthetic fuel from coal is to promote the local production of fuel alcohol. The organization specialist here is Tom Breitbach, who is chairman of a county steering committee on the development of an ethanol plant for Circle. The plant, he said, has been under consideration for about a year but so far is not funded. That has not prevented it from capturing the imagination of most of the farmers and ranchers. The plant would produce up to one million gallons of fuel alcohol a year from up to 500,000 bushels of grain; the used grain, which does not give up protein in the process, would be fed to cattle or hogs and —possibly—the resulting manure would be used to make methane gas which would be burned to heat the mash for distillation. As he talked about this process, which is a key part of environmental activist Barry Commoner's alternative solution for the nation's energy difficulties, Breitbach smiled, as if he held in his hand some wonderful secret. "It would also raise the price of grain," he said.

A few days before the Bureau of Land Management hearing, the U.S. Senate passed its version of the synthetic fuel program. It lowered the volume of Carter's request somewhat by requiring the production of 1.5 million barrels a day of synthetic fuels by 1995 instead of 2.5 million by 1990 and breaking the original $88 billion request into two installments, which gave the program a broader range for experimentation. But the government had clearly chosen its path. A report last year by the Energy Project at Harvard Business School had suggested that conservation could save five million barrels of oil a day by 1990. But Congress appeared to be echoing a much-quoted Texas Railroad commissioner who had said in 1977: "This country did not conserve itself to greatness; it produced itself to greatness."

On a Thursday evening, members of the organization took its methodical resistance to the Bureau of Land Management hearing in Glendive, Montana. "We strategized that a low-key, non-emotional hearing is probably our best shot," Helen Waller said. The only thing that wasn't low-key in the small room in the Dawson County Courthouse was the size of the crowd: about 120 people jammed themselves into a room probably designed to hold 75. It was an oddly quiet show of strength; the crowd simply sat and stood around the back of the room while Breitbach, Brown, Quick, Waller and Yarger and very few others spoke, all almost passionlessly condemning the Bureau of Land Management for failing to recognize the value of agriculture in making its frenzied plans to mine coal. Since almost everyone suspected, as they spoke, that their testimony would not count for much, perhaps the most important part of the meeting was the presence in the audience of 35 people from Golden Valley County, North Dakota, where there is also coal. The visitors from North Dakota had recently formed their own group patterned on the organization and were there to see how the work was done. Only one member of their group spoke, and very briefly; the rest were content to wait for their roles to mature. Like the members of the McCone Organization, they were farmers and ranchers: they could wait for the winter wheat or next year's rain; they understood patience. The network of resistance was spreading.

At BLM hearing in Glendive, residents from four counties gather to testify on mining proposals.

Mobile drilling rig for core sampling of coal juts into silent sky near proposed synfuel plant site.

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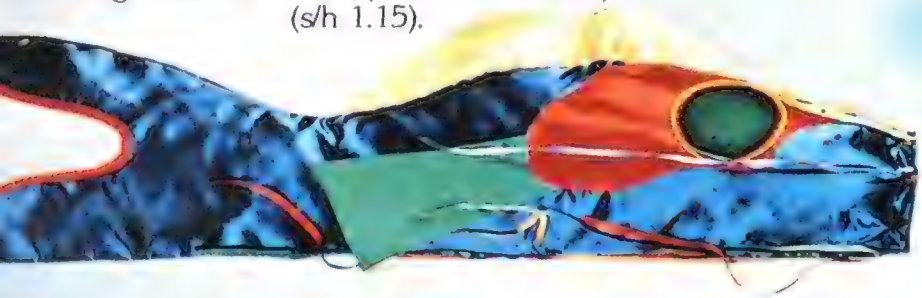

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An aerial acrobat practices piracy on the high seas

It takes them a long time to reach maturity, but then great frigates become masters of the air; they need every bit of their skill to survive

Wings outstretched and throat sac distended, this male great frigate bird displays to attract female flying overhead. Wingspan can be up to eight feet.

Photographs and article by Tui De Roy Moore

A frigate bird about 2½ months old is still largely covered with down. It will fly in another 3½ months, but parents will continue to feed it.

With a vibrating whoosh, the black bird plummets out of the tropical sky like a ragged bundle of feathers in what could be taken for a suicidal dive. But a few feet before hitting the water it suddenly brakes itself on flexible wings, its scissor tail spread widely. In a split second it snaps up a circling small fish from the surface and swallows it, then rises again on undulating wingbeats. This is just an ordinary meal for the great frigate bird, *Fregata minor*.

Five closely related species of frigates inhabit tropical and subtropical oceans of the world. Quite inept on land or water, they are truly at ease only in flight. Their aerial maneuverability is almost unreal: they swoop and rise with extraordinary speed and precision, swiveling, hovering, turning backwards or upside down in midair, techniques that are frequently used in stealing food from other birds.

Frigates have evolved to be highly maneuverable avian predators. A frigate's wingspan may reach eight feet, which with a body weight of only two to three pounds gives it the greatest wing-surface-to-weight ratio of any bird alive in the world. Many of their life tasks are performed on the wing: drinking, preening, bathing, feeding, gathering nesting material and perhaps even sleeping. Effective gliders and soarers, they depend on consistent moderate to strong winds, and return to land at night if the wind dies. Like all seabirds they wander far from shore, but unlike most others, they do not alight on the water.

Fossils found in Wyoming, and later described by Dr. Storrs Olson of the Smithsonian Institution, show that 50 million years ago the ancestors of today's frigates, *Limnofregata*, already fished the inland lakes of that region. At that time frigate birds were probably somewhat gull-like in habit, yet already exhibited the physical characteristics that have been perfected in the frigates of today.

The great frigate is the most widespread of the present-day species, nesting on many warm oceanic islands of the Pacific and Indian Oceans and two islands in the South Atlantic. It is highly pelagic and feeds largely on flying fish and squid caught by surface dipping.

Making the fullest use of the slightest updraft, it soars by the hour, usually about a thousand feet above the surface of the sea, turning and circling, rising and dropping with barely observable movement of its wings. I have watched one bathing by passing repeatedly through a dense low cloud, then shaking the water from its feathers. Frequently a frigate will scratch and preen in midair (p. 88), sometimes in full flight, other times closing one wing to reach a parti-

Belgian by birth, the author has lived in the Galápagos since she was two. A licensed naturalist in the park there, she is now at work on a book.

Another youngster about the same age shows a "cape" of black scapular feathers on its back that may help in regulating the young bird's temperature. Cape appears about the time the parents stop brooding.

cular feather while going into a momentary free fall.

Like that of most seabirds, the great frigate's life is focused on scarce and erratic food supplies. Although birds in each nesting colony begin to breed at the same time each year, individual cycles are long and drawn out, taking well over a year to complete. This indicates pairs can reproduce at the most only every other year. Each chick takes six months to fledge, but even after it has left the nest its parents will continue to feed it regularly for several additional months. On Aldabra Island in the Indian Ocean juveniles have been seen receiving food from their parents four months after they first began flying free over the ocean; in the Galápagos Islands in the eastern Pacific such activity has been noted for more than six months; and on Christmas Island in the central Pacific this time may stretch to as much as 14 months.

In 1964, J. Bryan Nelson, a British naturalist, spent seven months on Isla Genovesa (Tower Island) in the Galápagos, where he studied the great frigates nesting there. When the season begins in January or February, the male birds converge by the hundreds, stationing themselves in the shrubs of this desolate volcanic island to begin their courtship display (pp. 82-83).

The feverish commotion of courtship

In the brilliant morning sunlight, dozens of males sit atop the bushes, intent on drawing a passing female's attention. Their huge scarlet throat sacs are fully inflated and their black plumage glistens with a metallic sheen in the sun. When a female appears, flying quietly overhead, the males below display with increased intensity. With their heads thrown far back, they spread their great wings, vibrating them so violently that their shiny undersides appear to glitter. At the same time they burst into a concert of loud, clear warbles, swiveling on their perches to keep those fantastic balloons oriented directly toward the prospective mate.

If the female swoops down, she sends the entire assembly into an even more feverish commotion. After hovering for a few moments she may alight near one of them, ignoring the rest. There she sits, so close to him that their breasts and necks touch. For many hours the male will continue his fervent display. Sometimes the female leaves again to seek yet another male; otherwise she remains and joins him in the courtship, responding with rather hoarse squawks.

Once they're comfortable together, the next step is for the male to begin gathering nest material. I have noticed that each male seems to use one preferred technique to gather this material. Some dive low over shrubs and tear off thin leafy sprigs, while others prefer dead branches snatched from the ground or water

Here a male incubates an egg in the nest while female stands by. Birds normally mate for only one season.

A nestling about six weeks old screeches at the photographer, the same cry it uses to beg for food.

A chick reaches down its mother's throat for a meal of regurgitated fish. Young are fed for more than a year.

Male frigate bird (left) harasses a red-footed booby, trying to make it regurgitate its most recent meal.

in full flight. Still others specialize in pursuing boobies and other nest-building frigates to steal their material. The male keeps busy for several days while the female constructs the nest with what he collects. Every 15 or 20 minutes he swoops in from the sky and with soft calls presents her with one more item to work into the structure. As the nest building goes on the male's throat pouch, which he can inflate or deflate at will, begins to shrink; it will completely shrivel and lose its brilliant color within a month or so after forming of the pair bond.

After laying the single white egg, the female begins the long incubation period. For 55 days the mates will take turns, relieving each other about every ten days. While one bird is out at sea feeding, the other sits under the torrid sun incubating the egg.

Why such incredibly long incubation stints? J. Bryan Nelson suggested several reasons. The frigate that is off duty probably needs to travel far to feed and replenish lost energy. Nelson found that incubating frigates lose up to 20 percent of their already slight weight while they sit on the nest. And the fewer the changeovers, the fewer are the chances of knocking the egg off the nest. Even so, many eggs are lost.

Great frigates are predators and scavengers around nesting colonies, snatching unattended chicks of their own species or other seabirds. Even though the bulk of their food is acquired out at sea, they are experts at stealing food from other birds. The red-footed boobies, of which well over a hundred thousand nest on Isla Genovesa, must fly through a barrage of frigates gliding almost motionless on thermal updrafts. Many fall prey to their pirating.

Springing booty from the booby

By the hour I have watched this procedure as the boobies fly in to feed their young on regurgitated fish. At first all appears calm. Here and there the birds arrive, flying in a straight line from the ocean to their nests on the island, and many do pass unmolested. Then, without warning, one of the slow circling frigates far above ceases its effortless soaring and plunges like a rocket toward an incoming booby. The booby, glancing back apprehensively, accelerates to all the speed it can muster, emitting pitiful, panic-stricken screams. Other frigates often join the chase. If the booby does not immediately regurgitate its catch, it may very well be caught by the wing or tail and upended in the air until it relinquishes its precious food. With incredible precision the frigate will let go of the booby and snatch the falling morsel in midair.

The great frigate chick hatches from an egg weighing three ounces, naked (except for sparse traces of down) and helpless. Slowly it grows its first coat of

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down until it resembles a fluffy white ball. The parents continue to take turns shielding their young day and night against the weather and predators. When the chick is about two months old, the parents begin leaving it unprotected as they both depart to find food for the chick and feed themselves. At this time short-eared owls kill many of the chicks.

Between its parents' feeding trips, the chick that does survive spends long days alone on the nest. When a parent returns from the ocean, the chick immediately begins to beg for food, bobbing its head up and down and squawking. After a few minutes the parent drops its head and, opening its beak wide, allows the youngster to plunge deep into its throat for a meal of partially digested fish and squid.

Thus it goes on week after week, the young bird sitting hunched up on its nest (now cemented white with guano), awaiting the parents' return. After about six months, having shed its white down and acquired a black-and-white juvenal plumage, it will flex its great wings and lift into the tropical wind, ready to explore the adjacent sea. Yet for many more months to come it will continue to return regularly to some perch near the disintegrated nest to be fed by its parents. Every few days the juvenile may receive yet another load of fish while developing the neuromuscular coordination to feed itself. Then, having reached the age of a year or more, it will finally be ready for the airborne life.

It won't be easy to learn more about the great frigate. Dr. R. W. Schreiber, Curator of Ornithology at the Natural History Museum of Los Angeles, suggests that to understand its life cycle, someone will have to spend 20 to 25 years with a single population —without disrupting the birds' normal behavior. But a life devoted to this pirate of the tropical islands couldn't be all bad.

Totally at home in the air, a frigate bird scratches its head while in full flight. Middle toe has serrations that help bird "comb" its feathers. Some ornithologists believe birds may sleep in the air.

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NORTH CAROLINA

CENSUS
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By Carol Simons

Everyone figures in the greatest U.S. enumeration

The 1980 census will rely on the mails as well as on statistical headhunters to count everything but your blessings

With a new decade upon us, the government is again at work on its own book of numbers, and is preparing to count you in. Not only you but your family, your cars, your bathrooms and air conditioners, dollars earned, minutes spent getting to work and other aspects of life in these United States. This count is, of course, the census, formally the 20th Decennial Census of Population and Housing, a once-a-decade chore that may be the most intense national spasm short of, well, the Superbowl.

The 1980 census will yield some three billion answers about 222 million individuals and 80 million households, collected either by mail or by more than a quarter of a million temporary workers. Every known household—defined as a single person, family, or people living together as a unit—will receive a questionnaire. Most will receive short forms with 19 basic questions about age, sex, race, marital status and education plus a few extras on housing. But a small percentage of the population will be asked to fill out long forms with 65 questions—ferreting out additional facts about employment, income, automobiles, fuel costs, telephones and more. From these billions of answers, the Census Bureau will develop a statistical snapshot of what America looks like on or about April 1.

On that day the 1980 census officially begins. Ninety percent of the population receives its census forms by mail with instructions to return them, circles shaded for computers to read, blanks filled in, bathrooms accounted for. Census '80 marks the first time such a large mail-in response is being ordered, and the Census Bureau has its collective fingers crossed. Officials constantly pop up with the fact that for every one percent of the population that cooperates by mailing in the forms, the taxpayers save approximately $2 million in follow-up costs.

The other ten percent of the population, living mainly in rural areas where returns previously have been poor, will be visited by census takers. Such visits are not always easy; wild tales tell of census takers slogging through blizzards and desert heat, confronting biting dogs, antagonistic turkeys and menacing moose. In remote areas, census takers are charged with seeking out homes and the people in them. This year aerial photography is being used to locate dwellings on 20 Indian reservations. The photographs not only locate the home but help the census taker decide on the best approach, whether by river, road or a hike over the mountain. As varied as America's landscape are the ways census takers make their rounds—by foot, helicopter, horseback, dune buggy, bobsled, Jeep, car or catch-as-catch-can. In Hawaii outrigger canoes have been known to come in handy for visiting the island villages.

Urban areas pose their problems, too. Federal inquirers will walk warily through the nation's worst slums, entering "vacant" buildings to confirm or deny their status. On March 31—"transient night"—guests in hotels, motels, YMCAs, and any other place charging more than $4 a night, will be visited. Those in cheaper lodgings—flophouses, missions, bus and rail-

In April, no matter where we are or what we're doing, the Census Bureau will try to find us, every one.

Illustrations by John Huehnergarth

Decennial head count

Like Sisyphus trying to roll a boulder up a mountain, census officials face a task that is never-ending.

road depots, all-night movies—will have their turn on April 8, "mission night." And in time, in an exercise called the "casual count," even street corners, employment offices, food stamp centers, welfare offices and the steam tunnels under New York City could be visited by someone making the count.

The questions that will be asked are themselves an indication of how the country has changed since its last count in 1970. Thus, the changing role of women, exemplified by the fact that half of adult American women work, helps explain the disappearance in the 1980 census of the question about "head of household." Job titles for data presentation will undergo some revision: firemen are firefighters, stewardesses are flight attendants and repairmen are repairers. (Statisticians will still have to figure out how to categorize some of the more unusual occupations cited by the respondents, such as mouse farmer, subterranean architect, artificial limb breaker-inner, plumber's helper's helper, professional mourner, golf ball winder and gum taster.)

Other changes in the 1980 census reflect our heightened ethnic sensitivity: 14 categories are listed in the questionnaire, up from eight in the 1970 count. Thus, we may learn how many Samoans there are in Seattle, Aleuts in Albuquerque, and Guamanians in Grand Rapids. Everyone will be asked if he or she is of "Spanish/Hispanic origin," testimony to the political power of that growing minority. The census form itself will be available in Spanish.

New status for "roommates"

For the first time, those who live in an apartment will specify whether it is a condominium, reflecting a real-estate trend. A question about "partners" and "roommates" will give statistical visibility to live-togethers in a society where the rate of growth of households is greater than the rate of its population growth as fewer people marry, fewer have children, more are divorced.

But the essential and most dramatic fact is the one that answers the question: how many are we? By law, the Census Bureau must report the population of the states to the President by January 1, 1981, to carry out the original purpose of the census as stated in the Constitution: adjusting the representation in the House of Representatives. With the 1980 count, the Census Bureau estimates that our population will increase nine percent, from 203 million in 1970 to 222 million, and that 11 Congressional seats could shift. Gainers could be California, Florida, Arizona, Oregon, Tennessee, Texas, Utah and Washington. The states of Michigan, Pennsylvania, South Dakota, Illinois and Ohio could lose some seats, New York as many as four.

But if political apportionment prompted the first

Census takers have turned up throughout history, often trailed by tax collectors or army recruiters.

census, additional uses for the information have multiplied over the decades until the list seems endless. Federal and local agencies, businesses and individuals, all rely on census statistics for important information. The value of the census, according to one official, is not only that it provides statistics but that it breaks them down into very local neighborhoods, sometimes as small as a city block. Thus an orthodontist checks to see if a certain neighborhood has enough children of teeth-straightening age to warrant his setting up practice. A shoe-store owner uses census information to decide if he should specialize in running shoes or sensible oxfords. In Minnesota, Boy Scout leaders looked at census information to project how many camps might be needed to accommodate new Scouts. And in Denver, a young woman aided by the Census Bureau zeroed in on the neighborhood which had the most men who were unmarried, young and wealthy.

Censuses have always had a purpose; indeed, the word itself is derived from the Latin *censere,* meaning to value or tax. The Romans, Chinese and Hebrews counted people to draft or tax them. Such purposes did not make the census taker a popular figure in the ancient world; one account in the Old Testament says King David's census of Israel was inspired by Satan.

In 1086-87, William the Conqueror counted and recorded the landed gentry and the size and nature of their holdings in the *Domesday Book,* the final authority for property litigation. It remains a well-regarded description of England, and has been used by scholars to estimate England's population at the time as under two million.

The first complete counting of man, woman and child probably occurred in Nuremberg in 1449, the intent being to help estimate the amount of food needed in a siege. The results, typically, were kept a state secret. The first modern census system—a continuing, full count, repeated regularly and accurately—began in Sweden in 1749.

By then, people had discovered that they could learn more than mere numbers from a census. Demography, the quantitative study of human populations, or less formally, the science of sex and death, had its first real application in the 17th century. Like many sciences, demography began with amateurs, such as John Graunt (1620-1674), a haberdasher and citizen of London.

Graunt studied the bills of mortality—records of parish christenings, weddings and burials published Thursdays by parish clerks starting about 1600. From these he made "observations" about 17th-century life, for example, "That in London there have been twelve Burials for eleven Christenings" and "That every Wedding one with another produces four Children."

Such information allows a demographer to discern population trends, and to make predictions. But Graunt's work did not persuade the British that was necessary. Responding to a proposed census in the mid-18th century, one member of the House of Com-

The 1980 census will seek to count 14 distinct groups; for example, Aleuts living in Albuquerque.

In remote areas, census takers have sometimes had their task complicated by worrisome wildlife.

mons growled, "I hold this project to be totally subversive to the last remains of English Liberty."

The United States, in contrast, stipulated social introspection at its founding, writing a census into the Constitution as the basis for political apportionment. Although several colonies had earlier conducted local censuses, and the Comanches of the Great Plains and Southwest had long used bundles of reeds to enumerate their warriors, young men, women, children and lodges, the first federal census began in August 1790. It took 18 months. There were only six questions asked, sufficient to classify the population counted into free white males 16 and older, free white males under 16, free white females, other free persons (including taxpaying Indians) and slaves. Only the names of heads of households were recorded—by census takers who furnished their own pens and paper.

The government's decennial inquisitiveness, however, grew apace, along with the population, and by the late 19th century it was obvious that a makeshift army of clerks adding up tally sheets was inadequate: one census was still being interpreted when it was time to begin planning for the next. Census officials realized that a mechanical counting method was needed. Accordingly, they organized a competition, won by a former employee of the census office named Herman Hollerith. Partly inspired by the punch-card information principle of the jacquard loom, and by watching a railroad conductor punch tickets, Hollerith produced his electric tabulating machine, used on a large scale for the first time in 1890. A special "pantographic punch" encoded the information of individual census forms onto punch cards, and a tabulating machine then added up the results. *Electrical Engineer* commented in its November 11, 1891, edition that "This apparatus works unerringly as the mills of the gods, but beats them hollow as to speed." Hollerith formed a company to produce his machine and, in 1911, it became one of several small companies to form the basis of IBM.

Since its creation as a permanent organization in 1902, the Census Bureau's Sisyphean task has been to inspire new kinds of engineering ingenuity simply to keep up with the growing demands of the count. The first computer designed for commercial use, the UNIVAC, was built to the Bureau's specifications and first used in the 1950 census for a few states.

Today the magic word at the Census Bureau is FOSDIC, the "data capture system" adopted in the early 1950s. FOSDIC means Film Optical Sensing Device for Input to Computers, and it is the Bureau's system for getting our scribblings from the questionnaires onto magnetic tape for computers to use.

The route your form takes to get from paper to tape is a fairly direct one, starting from three processing centers in Indiana, California and Louisiana, where the forms are photographed by the "most unique camera in the world." The forms are held down onto a perforated belt, and the pages turned by three rotating arms. Each page is flicked up and over, flattened by a brush, snapped by the camera, and replaced by the next page—all at about 100 pages per minute.

From there, the resulting microfilm enters FOSDIC proper, its information transformed into computer-

readable characters at the rate of 750 frames per minute (the short form fills two frames). This information is almost simultaneously transmitted through telephone lines to census headquarters at Suitland, Maryland. The original forms are eventually destroyed; and the microfilm—the only way to identify who filled out what form—is sent to Kansas for storage.

Burgeoning speed is the leitmotiv of computers, the Bureau's included. The 1970 FOSDIC system could do in 15 seconds what a 1960 machine could do in 60, and what a punch-card operator could have done in eight hours in 1950. And the 1980 system is one-and-a-half times faster still.

Without all this high-speed technology, the Bureau would be buried under mountains of meaningless numbers. With it, the statisticians and other specialists can grasp at otherwise elusive information. Analysis is a fine art along the endless halls of the Census Bureau at Suitland, just outside Washington. About nine months after you fill out your census form, billions of numbers and stacks of tables will wind up on the desks of Bureau statisticians, demographers and analysts, specialists in such fields as social sciences, economics, agriculture, minority affairs, housing, transportation and energy. They assemble and check the figures, with some interpretations, making the information available to the public. "When it comes to conclusions, the Census Bureau is pretty neutral," commented one official, adding that it's the government agencies, private industry, academics and others who use the census statistics to do in-depth analyses.

In Hawaii, census takers once relied on canoes, but now reach villages by island-hopping aircraft.

One census taker, finding a farmer plowing a field, got her answers only by waylaying the tractor.

Under such scrutiny, many questions on the census form can reveal more than meets the eye.

One question in the housing section of the long form, for instance, asks if you have air conditioning and, if so, how many units. Such data supplies the Department of Energy with information about neighborhoods and houses which might have sufficient wiring to switch to electric heat if other sources run out. A count of automobiles per household members affects air pollution control laws and aids transportation officials in planning roads, traffic patterns, parking meters and, as one statistician put it, allows planners to say, "Mr. Developer, you've got to supply 1.1 parking spaces per apartment— or 1.5 spaces."

Or consider the question on the long form: "Where did this person live five years ago?" The answers will indicate which parts of the country are growing in population due to migration, which are shrinking, and, with other questions on the form, the characteristics of the migrating population. Census demographers expect the 1980 figures to confirm a move from the North and East to the South and West. Another shift being measured is migration from metropolitan areas to nonmetropolitan and rural areas, although there's already some suspicion that this "rural renais-

In keeping with confidentiality of census, an escaped convict can be interviewed but not turned in.

sance" of the last decade may turn out to be a short-term trend.

The relationship between residence and workplace, plus concerns about availability of energy, resulted in a number of questions about where you work, how long it takes you to get there, what transportation you use (12 choices include bus, car, van, motorcycle, bike or foot) and whether you carpool. According to experts, the answers are likely to indicate that people make long commutes to work, that use of public transportation may be on the decline, that much commuting is suburb-to-suburb. Results might prompt a local area to start a bus route, create a bike path or restrict a street to one-way traffic.

And even as statistics continue to spill from the decennial census, the Bureau is running additional specialized inquiries on everything from wheat to welfare. For example, it takes an agricultural census every five years, so that we are more current on the population of American pigs than people. This may be altered by plans for a mid-decade population census to be taken in 1985, although its actual scope and ambitions are still cloudy. We know how many people are unemployed or are looking for jobs because of the Bureau's monthly Current Population Survey done for the Bureau of Labor Statistics. The 1977 Census of Governments showed that revenues of county governments went up slightly more than their expenditures. The 1976 Survey of Income and Education told us that 1.25 million American women got child support in 1975 from the fathers of their children and that these child-support payments kept many mothers above the poverty line.

The questions and answers on the decennial census as well as on other periodic surveys have particular significance in a time of "special interest" politics. The census has become the touchstone for many governmental decisions, most especially those awkward ones about who gets how much. Some 50 billion dollars from more than 100 federal programs are now distributed each year according to population statistics. And uncounted may mean unfunded.

The census missed 5.3 million people in its 1970 count—2.5 percent of the population. It missed a far higher proportion of blacks than whites (almost eight percent of all blacks as against 1.9 percent of whites, and more than 18 percent of black men ages 25 to 34) and a wholly unknown number of Hispanics. Efforts to avoid an undercount in 1980 are extensive but the census itself is regarded as such a mammoth task, and our society so complicated, that a true count is virtually impossible.

The Census Bureau is being guided through its 1980 ordeal by its director, Vincent Barabba. Barabba's strengths derive in part from his unrestrained enthusiasm for the work and competence of the Census Bureau, and his understanding of why the 1980 census is so important to so many different groups. "In the past," he says, "the census has been primarily an analytic tool and now it's an allocation tool. . . . A lot of people have assumed that because you have this 'objective' approach that it's more accurate, less political. That was not an entirely true assumption, mainly because these devices were never designed to be as precise as what they are now being requested to do."

Among the missing: Thomas Jefferson

Indeed, the undercount is not a new problem. Its consequences are simply greater than when, in the first census, Thomas Jefferson apparently found himself among the uncounted. To help improve the coverage this year, the Bureau is encouraging media campaigns in minority sectors and recruitment of bilingual census takers. There is also a greater resort to mailed forms and more repetitive checking of mailing lists which themselves come from various sources. Census takers are instructed to explore all possible living quarters, defined as "any place where people live or could live." The Bureau has 200 community services special-

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ists in the field to publicize the importance of being counted. And when the count is over, there are provisions for local officials to evaluate the totals and make appeals for revision.

Besides the monetary and political benefits which depend on the count, the workers stress the confidentiality of the census. The Bureau's records cannot even be subpoenaed by a judge. Illegal aliens or escaped convicts can give their census information without fear of being turned in. Names and addresses are not entered into the computers, nor does the census ask for social security numbers. The microfilmed forms in storage are closed to the public for 72 years although, upon request, the Bureau will release information to people seeking facts about themselves, such as proof of residence, or to heirs or legal representatives. "The material we get is all jumbled up, all numbers," one official observes. "We don't deal in names."

For all that, an undercount is probably as inevitable as death and taxes. Some people just don't trust the government. And there is hardly a trait more American than the prickly individualism that asserts itself when the government gets inquisitive, a trait epitomized by the 19th-century humorist Artemus Ward, who mocked the census by asking: Did you ever have the measles, and if so, how many?

Census figures are now basis for allocating huge sums of federal money, as well as seats in Congress.

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Jack Alcock and Teddie Brown, all dressed up for visitors, stand by their plane at Lester's Field.

By David Nevin

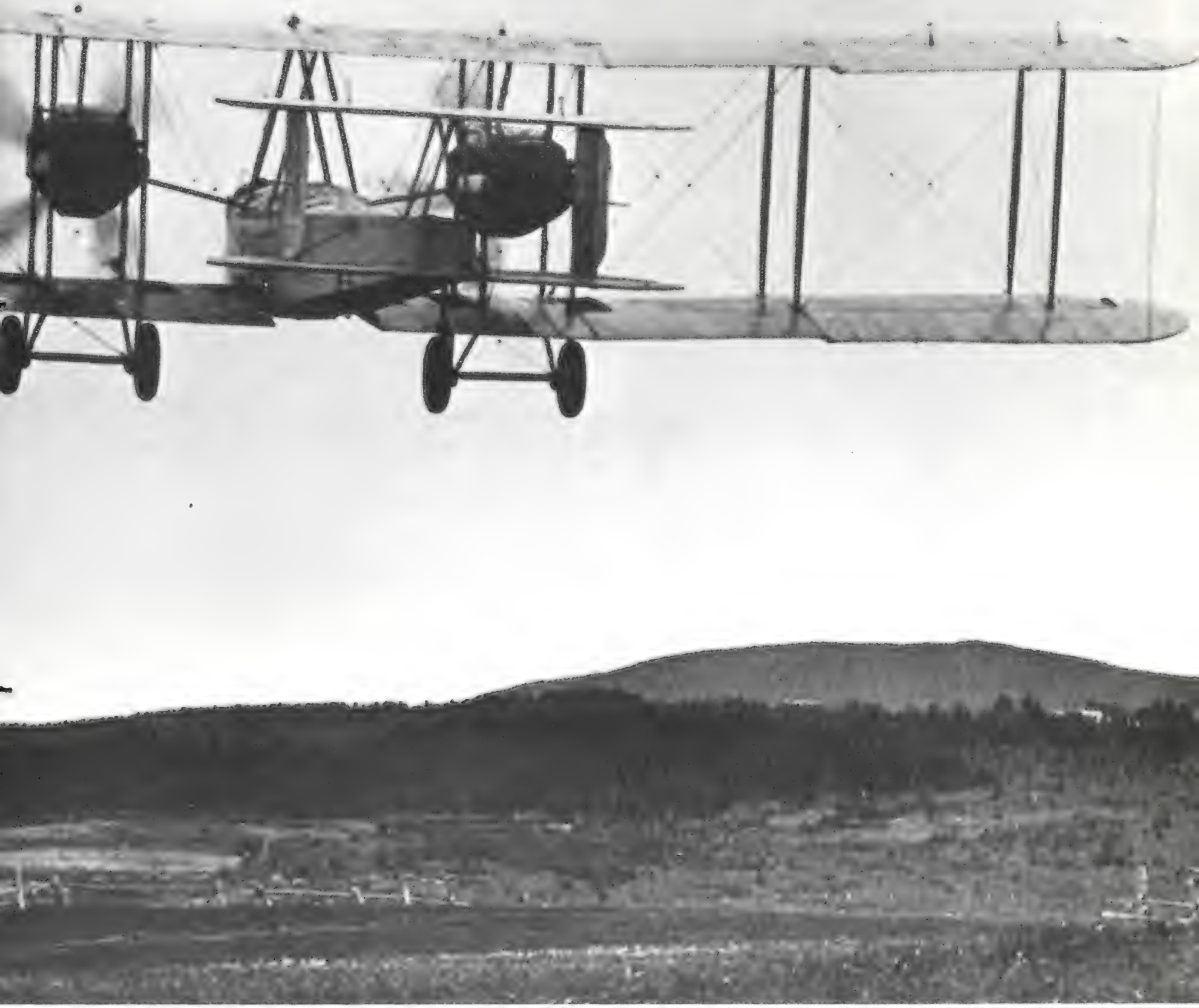
Two daring fliers beat the Atlantic before Lindbergh

In 1919, British airmen Alcock and Brown took off from Newfoundland and headed for Ireland nonstop; they made it—barely

On the way at last, the Vickers Vimy lurches off its improvised Newfoundland aerodrome. It was

When Charles Lindbergh landed in Paris in 1927, headlines screamed: ATLANTIC IS CONQUERED! In fact Lindbergh was the first to fly nonstop from a city in the United States to a city in Europe. But the Atlantic had been conquered by airplanes eight years earlier. In May 1919, it was crossed by a U.S. Navy seaplane (p. 105) that refueled in the Azores. Just a month later it was crossed once again—this time nonstop—by a pair of British fliers, Alcock and Brown.

In the decade after the Wright brothers achieved



altered to carry extra fuel instead of bombs.
The Rolls-Royce engines put out 360 hp each.

powered flight in 1903, aviation created a fascinated audience and served as a magnet to eager young adventurers. One of these enthusiasts was John Alcock, apprentice engineer in Manchester, England, a cheerful youngster with ginger-colored hair and a loud laugh, whose infectious enthusiasm made him popular. One day in 1910, when Alcock was 18, he witnessed the landing of a plane that had just made a record-setting flight from London, and he decided on the spot that no life but aviation would satisfy him.

He hurried off to Brooklands—a racetrack-turned-aerodrome about 20 miles southwest of London—and talked Maurice Ducrocq's flying school into engaging him as its staff mechanic. Here toiled aircraft builders whose names and products would soon become famous in World War I: Bristol, Avro, Sopwith, Martinsyde and the recently established aviation division of Vickers Ltd., the famous armaments manufacturer.

It was the life Alcock had dreamed of. He repaired airplanes and off-duty he haunted the Blue Bird café,

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The Vimy's competition mugs in front of Cochrane Hotel. From left: Grieve, Raynham, Hawker, Morgan.

talking aviation with other young men in greasy whipcords and leather jackets. He learned to fly in two hours by sitting behind Maurice Ducrocq in flight and resting his hands on Ducrocq's hands. He soloed in an old Farman pusher and went off to win a race at nearby Hendon aerodrome. But such events paled in comparison to the challenge—and reward—offered in 1913 by Lord Northcliffe's *Daily Mail:* a prize of £10,000—then worth $50,000—for the first nonstop flight across the Atlantic.

Clearly, no plane then flying could perform the feat. But Lord Northcliffe's intent was to stimulate aeronautical advances. The shortest distance across the Atlantic Ocean—some 1,880 miles—lay between Newfoundland and Ireland. A nonstop flight of such distance would require huge gasoline tanks and engines that could operate faultlessly for 20 to 30 hours, roughly ten times the 1913 average. Before anyone had risen to Lord Northcliffe's challenge, World War I intervened. Alcock joined the Royal Naval Air Service and flew bombing missions against the Turks, who shot him down in the waning months of the war. As a prisoner, he talked endlessly to his mates of his plans to fly the Atlantic. At the war's end, Vickers Ltd. offered him the chance to fly their latest aircraft in quest of Northcliffe's Atlantic prize.

Vickers' works manager, Maxwell Muller, led Alcock into the assembly shed to have a look at the plane. There, half finished, stood a Vickers Vimy—a big,

Speedy Martinsyde with Raynham and Morgan cracks up on its takeoff for Ireland. Morgan was injured.

Sopwith plane carrying Hawker and Grieve ditches at sea 14 hours out. A freighter rescued them.

handsome biplane designed as a bomber with a two-man cockpit and a wingspan of slightly more than 67 feet. Its two reliable 12-cylinder Rolls-Royce Eagle Mark VIII engines each generated 360 horsepower. With bomb racks removed, a forward gunner's cockpit omitted and new tanks installed that would nearly double the original fuel capacity, the Vimy would be ready to go. Though 865 gallons of gasoline would make the plane 1,000 pounds overweight, Vickers Ltd. was confident that it could not only get off the ground but, at a cruising speed of about 100 miles per hour, stay up long enough to cross the ocean.

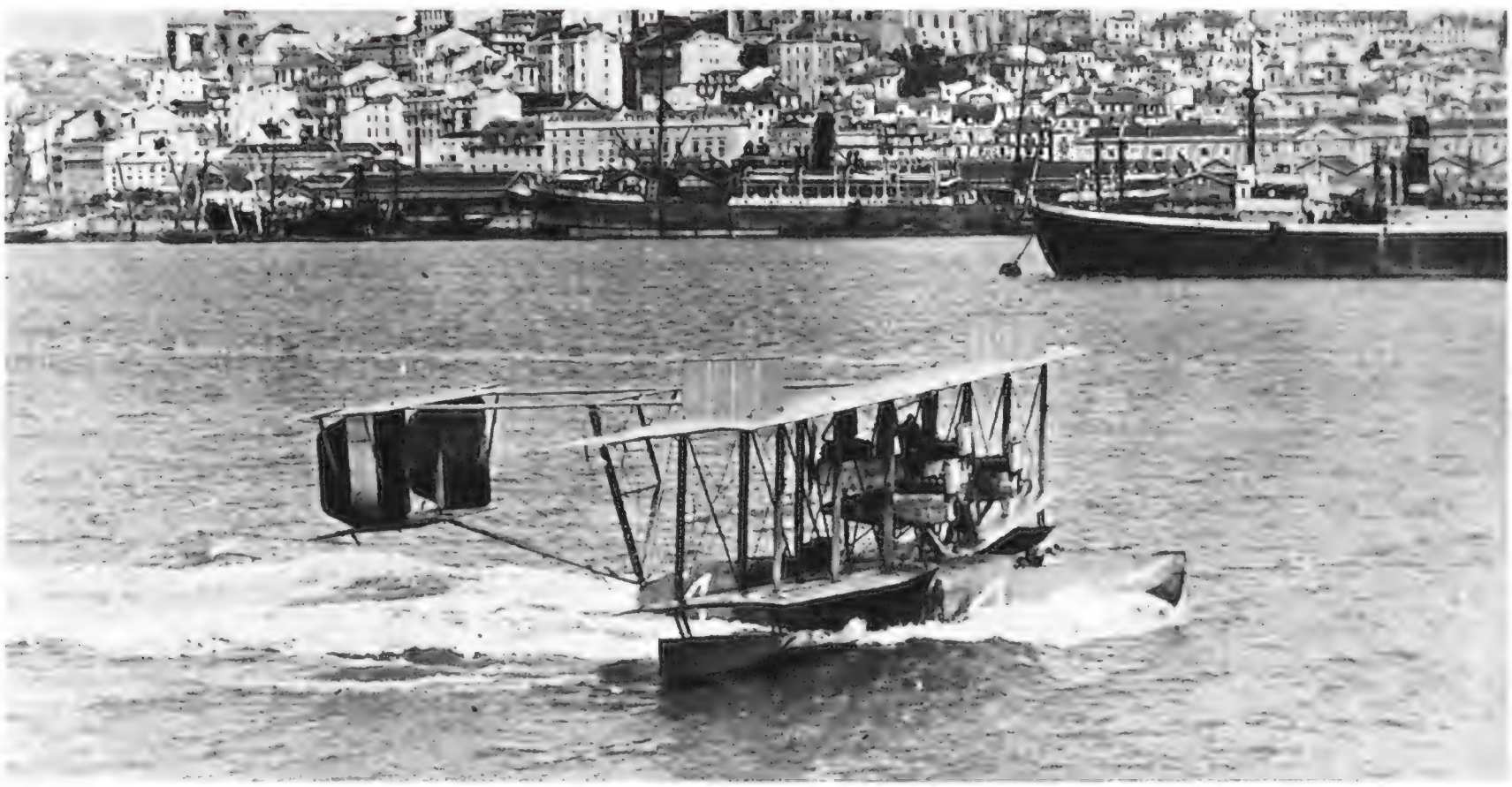
With Alcock enrolled as pilot, Vickers had only to find a navigator. A few weeks later, a quiet man in a neat Royal Air Force uniform limped into Max Muller's office leaning on a walking stick. His name was Arthur Whitten (Teddie) Brown and he was an engineer looking for a job. In the interview that followed, Muller happened to mention aerial navigation. It was like opening a floodgate. Brown talked knowledgeably of sextants, star sightings, drift calculations.

Born of American parents and raised in Manchester, Brown had relinquished his U.S. citizenship to join the British Army. He became an aerial observer, then crashed behind German lines, injuring his left leg. A prisoner of war like Alcock, Brown had spent his months of incarceration mastering navigation with books procured through the Red Cross. Could he, Muller asked, navigate a plane across the Atlantic? He could indeed. It was the very puzzle he had posed for himself, and solved, in prison camp.

Muller led Brown out to the works and showed him the Vimy. "That's our bus," he announced, "and there's the man who's going to fly her. Come and meet him." Brown was instantly impressed. Jack Alcock, dressed in overalls and a tweed jacket, radiated an insouciant confidence. Within minutes the two men were sketching transatlantic routes in chalk on the floor.

By April 1919, Northcliffe's prize for the transatlantic flight had risen to £13,000, and a competition had developed in which Alcock and Brown were late starters. There were three other major contenders. Harry Hawker was a lean young Australian with dark curly hair and a quick smile. Back injuries suffered in numerous plane and car accidents had kept him out of World War I but had not prevented him from test-flying 283 aircraft in two years. He would fly for the Sopwith Company with Lt. Cmdr. Kenneth Mackenzie Grieve of the Royal Navy as navigator. The Sopwith Atlantic, powered by a single Rolls-Royce Eagle, could drop its landing gear after takeoff and so gain seven mph for a top speed of about 100. It would land on a belly skid.

The Martinsyde Company entered a smaller and more streamlined biplane which, though powered by a Rolls-Royce Falcon of only 285 hp, could cruise at 110 mph. It chose Frederick Raynham as pilot. At 26, Raynham looked barely out of his teens, but had



U.S. Navy's NC-4 landed at Lisbon after first transatlantic flight—but not a nonstop crossing. The flying boat carried a five-man crew, took 11 days for the trip from Newfoundland to Portugal.

Raynham offered his field and his hangar tent at Quidi Vidi to Alcock and Brown after his own plane crashed. When the tent proved too small for big Vimy, Alcock and Brown used it to store equipment.

learned to fly in 1911 at Brooklands. His navigator would be Captain W. Fairfax Morgan of the Royal Naval Air Service.

Handley Page Ltd. entered its V/1500 bomber, the largest plane then flying. Powered by four Rolls Eagles, it carried a crew of two plus a commander, Admiral Mark Kerr.

All four major entrants planned to take off from Newfoundland and hoped for a tail wind clear to Ireland. By May 1, 1919, all the entrants but Alcock and Brown had set out by sea for the starting point. The Vimy men were still making final preparations.

On Good Friday they attached the last wire brace to the Vimy and tried it out. Alcock was delighted: "It's a piece of cake. All we have to do is keep the engines going and we'll be home for tea." Alcock and Brown took a passenger ship and arrived in St. John's on May 13, well ahead of the freighter-borne Vimy. It was midnight, in the middle of a violent storm, when they beat on the door of the Cochrane Hotel. Eventually it was opened by Agnes Dooley, the proprietor's sister-in-law.

"We're the Vickers party," Alcock announced. "We've come to fly the Atlantic."

"Lord save us," said Miss Dooley. "More flying people. The hotel's full of you already. Is the whole world gone daft?" But she took them in, and the next morning at breakfast Hawker and Raynham and their crews gave the Vimy fliers a raucous welcome.

The immediate problem was to find an airfield. The hilly terrain made level fields rare, and, to take off, the heavily laden planes would need an unobstructed run of at least 300 yards. The best of the makeshift sites had already been taken. Raynham and Morgan occupied a meadow near Quidi Vidi lake, a half mile from St. John's. Hawker had claimed an L-shaped field of 40 acres near Mount Pearl, six miles away. Neither strip would be long enough to accommodate the Vimy. Admiral Kerr took the Handley Page to an isolated site near Harbour Grace, 60 miles away.

Brown spent his days asking where he might find level ground, while Alcock drove an old Buick touring car around farm roads on a similar search. The only fields they were able to locate were planted with crops. It seemed as though Alcock and Brown would be the last contestants to start. They had no airfield and their plane was still at sea.

Soon the Sopwith, the Martinsyde and the Handley Page were assembled and ready to go, but foul weather held them down. Admiral Kerr kept to himself at Harbour Grace, but at St. John's, Hawker and Raynham were feeling the tension of competition. They haunted the weather station and watched each other like terriers until at last they struck a gentleman's agreement to give the other notice should either decide to go. Each day Agnes Dooley prepared sandwiches and thermoses of tea, just in case.

The weather broke on May 18 and both planes readied for takeoff. Hawker and Grieve got off first, the heavily laden Sopwith lumbering into the air with agonizing slowness. They made a turn over Quidi Vidi to salute Raynham and then headed eastward across the sea. Raynham, in a faster aircraft, expected to overtake Hawker. A crosswind was blowing over his field. The plane ran along with dangerously little lift until

This article has been adapted from a chapter in The Pathfinders *by David Nevin, which is being published this month by Time-Life Books Inc.*

Vickers Vimy, with 67-foot wingspan, sits in the open at Lester's Field while riggers and mechanics tinker with it, tuning it up for historic—and scary—takeoff. With tanks topped off, plane was half a ton overweight.

a bump tossed it into the air. It sagged along for another hundred feet, drifting sideways, and then fell to Earth, demolishing its landing gear and crashing nose-in (p. 104). Raynham was unhurt, but Morgan was taken to the hospital.

All that night the aviators waited for news of the Sopwith. None came and by afternoon it was clear that Hawker and Grieve had gone into the sea (p. 104). Then, a week later, a freighter hove to off Ireland and signaled that it had both men aboard. The Sopwith's radiator had clogged and the engine overheated. Hawker had climbed and dived repeatedly, trying to shake loose what he assumed was debris in the radiator. About 12 hours out he had realized he would have to ditch. He spent two hours searching the shipping lanes, found a freighter and landed in a trough. Then he and Grieve unshipped the upper part of the fuselage which was designed as a lifeboat and rode towering seas for 90 minutes while the freighter struggled to get a boat to them.

The huge crates containing the Vimy arrived on May 26, the day after the news of Hawker's rescue. Raynham had offered the use of his field at Quidi Vidi to assemble the Vimy, though the field was too short for the bigger plane to take off with a full load of fuel. A local drayman named Lester took charge of hauling the plane. "Don't you worry, skipper," he boomed at Alcock. "We'll get your flying machine up to Kiddy Viddy even if we have to knock a few houses down and build a bridge." A fence or two did have to come down, some houses were chipped, a bridge had to be disassembled—but Lester delivered the plane.

Alcock had not yet found a suitable field when Lester offered a pasture. It measured only 300 yards, but beyond it lay 200 yards more of reasonably open land. Boulders were moved, trees felled, a stone dike taken down and a ditch filled. After three days of toil, the meadows satisfied Alcock. "We'll call it Lester's Field," he promised. "The first transatlantic aerodrome!" And looking it over with his navigator, he added, "I hope we only have to use it once."

They would have to use it quickly. On that same day, the first warm Sunday of a tardy Newfoundland spring, they heard Admiral Kerr's Handley Page drone serenely overhead. For a moment they feared that it was setting out for Ireland. But no; the flight was only a trial run.

A gale blew in on the 10th and 11th of June, postponing takeoff. An exasperating cable arrived from Britain: WEATHER PERFECT HERE. PLEASE CABLE REASON FOR NONSTART. The normally good-natured Alcock lost his temper for the first time. Brown went fishing to calm himself.

On June 13 the weather seemed to be improving. Alcock had the Vimy fueled with gasoline hand-pumped from drums and filtered through fine copper mesh. One of the riggers tacked a horseshoe under Alcock's seat for luck.

It required most of the morning to fill the tanks. As the plane took on weight, a mechanic clutched Brown's arm and pointed at the undercarriage. A shock absorber had broken and the plane was sagging. It took all afternoon to empty the gasoline tanks so that the plane could be repaired. The crewmen worked all night by the light of automobile head lamps and paraffin flares to fix the Vimy and fill its tanks again.

On the morning of the 14th, everything was ready. The 4 A.M. weather report was typically sketchy:

"Strong westerly wind. Conditions otherwise fairly favorable." It was the best forecast they would get. Brown dressed in his uniform. Alcock donned a blue serge suit, and before dawn they drove to the field. Presently a boy on a bicycle set out after them: he was carrying sandwiches and a thermos from Agnes Dooley. Brown wrote that "a large black cat, its tail held high in a comical curve," sauntered by. "Such a cheerful omen made me more than ever anxious to start." It also reminded Alcock to fetch their own mascots, two stuffed cats named Lucky Jim and Twinkletoes. Lucky Jim was lashed to a wing strut and Twinkletoes (p. 109) rode tucked into Brown's flying suit.

The wind continued to bluster, but the weather was as good as any the two fliers had seen during their weeks in Newfoundland. Alcock told Brown quietly that if they did not go now, they probably never would. Brown agreed, and both men climbed into the cockpit. Alcock fired up the two engines. One after the other they threw out a cloud of blue smoke and settled into a smooth and steady beat. He raised his hand to the men who stood in front of the wings, braking the plane. One of them later remembered: "Alcock revved up the engines to full power. Then, on a signal, we all sat down on the ground and the plane shot forward."

Lurching from side to side in the wind, the Vimy lumbered over more than 300 of its allotted 500 yards, "showing not the least desire to rise." Raynham watched in anguished silence. When they were "almost at the end of the ground tether allowed us," Brown recalled, the plane rose, skimmed narrowly over a stone dike and a row of trees, then sagged below a hillcrest a few hundred yards away. The crowd, certain that the Vimy had crashed, started to run. A doctor pushed people aside, shouting, "Make way—they'll be needing me." But then the Vimy reappeared, airborne and climbing (pp. 102-103) with Brown waving from the cockpit. Brown looked at Alcock and noticed "perspiration of acute anxiety" running down his face.

Ships in St. John's harbor saluted them with whistle blasts they could not hear. At 1,200 feet, they crossed the coast. Flying under patchy clouds, they saw icebergs on the horizon. Brown radioed a message: "All well and started." Then the wind-driven generator propeller sheared off, leaving the radio powerless (below). There would be no asking for help or guidance.

Perhaps they would need none. The weather appeared favorable and they were riding a whistling tail wind. Brown now faced the formidable task of finding the way to Europe in a speeding aircraft. He had a standard naval sextant with which to shoot the sun or stars. The sextant had a crude artificial horizon in case clouds obcured the real horizon, as they so often did. Using a slide rule and navigation tables, he could convert the sextant readings into a position on the chart he carried open on his knees. When the sky clouded over, he could rely on dead reckoning—estimating the effect of wind velocity and the Vimy's airspeed on the plane's position. The trouble with dead reckoning was that a crosswind could blow them as much as 50 miles off course in an hour, a potentially fatal deviation. To measure this sideward motion, Brown had an instrument called a drift-bearing plate. But he could use it only if he could see the water; when clouds obscured the sea, crosswinds would be undetectable.

Kneeling in his seat, Brown pointed his sextant toward the southwest to make his first sun shots. Then, with drift and speed measured from the waves, he be-

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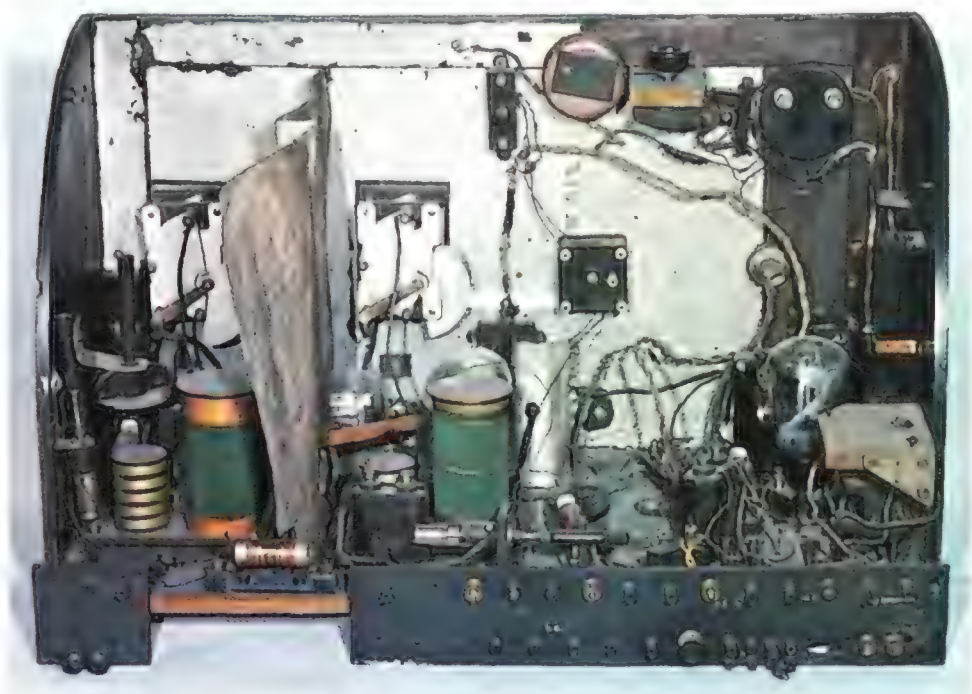

Vimy's radio went dead early in flight when small wind-driven propeller, powering generator, sheared off.

gan to lay out their progress on the chart. He had barely acquired this basis for dead reckoning when they passed over a vast fog bank and lost sight of the sea. Then the haze above thickened and blotted out the sun. There was no way to determine their position.

Half an hour later, the starboard engine made a noise like a machine gun firing at close quarters. "A chunk of exhaust pipe had split away," Brown wrote later, "and was quivering before the rush of air like a reed in an organ pipe. It became first red-, then white-hot, and softened by the heat, it gradually crumpled up. Finally, it was blown away." The exhaust flame, now undiverted, played on a bracing wire. It, too, glowed red-hot but did not break, and the flames did not appear to be reaching the flammable fabric skin of the aircraft. Alcock and Brown roared on, the brutal noise blasting their ears.

The Vimy's cockpit, though open, was partially sheltered. At 7:30, Brown twisted around and dug out Agnes Dooley's sandwiches and opened a thermos. He handed Alcock's share of the meal to him a bit at a time and Alcock ate with one hand on the control stick. Throughout the long flight, Alcock would never let go of the controls. After supper, Brown passed a scribbled note to Alcock: "I must see the stars."

Up they climbed until they broke out of the clouds into dim moonlight at 6,000 feet. The air at this altitude was much colder than they had experienced so far. With aching fingers, Brown turned the knobs of the sextant and found his position. Eight hours out, they had flown 850 miles, almost half the distance to Ireland. These figures translated into an average ground speed of 106 miles per hour, slightly more than they had anticipated. Alcock dropped to 4,000 feet and skimmed the top of the clouds.

At 3 A.M., as dawn was streaking the sky, a cloud appeared like a wall before them and they plunged in. The plane careened in violent winds, and Alcock, unable to see the horizon, became disoriented. "Left to its own devices," Brown recalled, the Vimy "swung, flew amok and began to perform circus tricks. Until we should see either the horizon or the sky or the sea and thus restore our sense of the horizontal, we could tell only by the instruments what was happening." But the Vimy's primitive blind-flying instruments were no help. The airspeed indicator had jammed at about 90 miles per hour, so that Alcock was unaware that he was flying the Vimy slower and slower, approaching stall speed. Suddenly the Vimy shuddered, its flying speed exhausted. The nose dropped and the plane whipped into a spin. Down they plunged through the blackness. The sinking altimeter told them they were falling; the revolving compass told them they were spinning. But "how and at what angle we were falling we knew not," reported Brown. "Alcock tried to centralize the controls but failed because we had lost all sense of what was central."

The altimeter showed 3,000 feet . . . 2,000 . . . 1,000 . . . 500. In the quiet of the throttled-back engines, Brown could hear the sea thundering below. He stuffed the flight log into his jacket, though he knew that if they hit the icy water they had no chance.

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Alcock wore blue serge vest with inflatable tube for flotation.

Brown tucked Twinkletoes, his toy cat, into flying suit . . .

. . . and wore battery-heated jacket and innersoles.

Then, as abruptly as they had entered the cloud, they popped out of it. The ocean was less than 100 feet below but the plane was nearly upside down, so that the water appeared to threaten them from above. Alcock's ability as a pilot would never be more severely tried. At the sight of the water, his equilibrium returned. With only seconds to live, he snapped the plane out of the spin, leveled off and shoved the throttles forward. The propellers bit the air and the plane flew along no more than 50 feet above the Atlantic. Brown felt that he could almost have reached out of the cockpit and touched the whitecaps.

With the instruments registering again, Alcock started up into the murk. Heavy rain fell, and as they gained altitude it turned to snow that coated the plane. Ice began to form. Several times Brown had to stand on his seat and, clutching a strut with one hand, use the other to clear the snow away from the face of a vital fuel gauge and from the tubes that governed the airspeed indicator. Somewhere above 11,000 feet, Brown caught a glimpse of the sun through the clouds and took the long-awaited sun shot. They were 80 miles from Ireland.

Then a series of sounds like rifle shots cracked from the starboard engine. Alcock shut it down. Ice had partially covered its air intake, causing it to backfire. With the other engine idling, Alcock began a long and shallow glide toward warm air at a lower altitude. The plane could not fly on one engine; the question was whether the ice would melt before they struck the water. Down they went until they broke into the open, 500 feet above the sea. Alcock restarted the dead engine, then advanced the throttles; the engines responded with a healthy roar. Twenty minutes later Alcock and Brown passed two islands, and ten minutes after that they were over Ireland.

Alcock swung the Vimy along the coast, saw the radio masts of the military installation at Clifden and headed for a smooth green field nearby, which was actually an immense bog. Men on the ground tried to wave the Vimy away from its intended landing spot, but Alcock and Brown took it as a welcome and waved back. As the Vimy touched down, its wheels and nose dug in, its tail jerked up. Both men scrambled out, Brown nursing a bumped nose. They had been in the air—takeoff to landing—16 hours and 28 minutes.

Both men became instant heroes. They were idolized in London and at a luncheon at the Savoy Hotel were presented checks for £13,000 (about $65,000) by the Secretary of State for War and Air, Winston Churchill. The next day they were knighted by King George V. Meanwhile, in Newfoundland, Admiral Kerr saw no point in being second to Alcock's first and took the Handley Page to the United States—where it crashed in Cleveland.

In December 1919, six months after the Atlantic flight, Sir John Alcock attempted to land a new Vickers Viking in a fog in France, fouled a tree and crashed. He died a few hours later. Sir Arthur W. Brown lived well into the 1940s, but never flew again.

Vimy nuzzles an Irish bog in triumph, not ignominy. After crossing Atlantic in 15 hours, 57 minutes, many of them hair-raising, Alcock and Brown had tried to land on what seemed a good field. They were unhurt. Their memorial, opposite, an idealized likeness, stands at Heathrow International Airport, London.

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Skateboarders (and a tricyclist) pause on a bridge spanning one of Venice's few remaining canals.

Morrie Rosen, director of the Israel Levin Senior Adult Center, with five of its 750 elderly members.

By Charles Lockwood

Wheels and deals keep California Venice spinning

Roller-skaters, booming real estate values and an influx of the trendy are changing this Los Angeles suburb virtually overnight

Venice, California, is not much like Venice, Italy, though it was intended to be. The aristocratic old city on the Adriatic is rather somnolent these days, but its Southern California namesake is anything but: it's a genuinely eccentric and much-loved community, a high-energy human circus and a curious historical spot, all rolled into one. It is one of the few places in Los Angeles where people get out of their cars and walk around like residents of traditional East Coast and European cities, and thousands of visitors fill the town on weekends to experience its color and flavor.

Venice is a free-spirited, economically and socially diverse community of 40,000 residents, which stretches for a mile and a half along the Pacific Ocean between Marina del Rey to the south and Santa Monica to the north. It's a place where just about anything goes. Elderly Jews, burnt-out hippies, and young men and women on the loose live in run-down three- and four-story hotels and apartment buildings along the beach. Artists, writers and growing numbers of affluent Bohemians have moved into bungalows on the narrow, garden-lined streets near the beach, or along the remaining picturesque canals that originally gave Venice its name. Blacks and Hispanics live in the Oakwood district half a mile from the beach. And some Venice residents don't have homes at all: they simply park their cars or vans near the beach and live there for months, even years, before moving on.

Venice is raunchy in places, but it is still a beach town, blessed with day after day of warm and sunny weather, soft ocean breezes and virtually smog-free air. Yet in spite of all of its attractions—indeed, because of them—Venice has its own problems. They are not unique to Venice; they are the problems that confront any town when it is suddenly "discovered" by large numbers of people who hadn't known, or cared, that it was there. The old are dislocated by the young, the poor by the affluent, the traditions by the trends. People change slowly; places these days—places like Venice, anyway—change overnight.

And today it is change that meets the eye. Some creative people have always been attracted to Venice. The late Charles Eames—designer, architect and producer of films, although perhaps best known to the public for the Eames chair—worked in Venice for more than 30 years. But now artists of every kind, discovered and undiscovered, are moving there. Painter Billy Al Bengston has a studio and Tony Bill, coproducer of *The Sting,* lives and works in a beautifully renovated building half a block from the beach.

On one recent weekend, a visitor could attend the

Mr. Lockwood, author of four books on American architecture and cities, wrote about the Green-Wood Cemetery in Brooklyn for SMITHSONIAN, *April 1976.*

Color photographs by Chad Slattery

Wheels and deals in Venice

"Bank-riding" skateboarder transfixes onlookers as he reaches top of ramp on Ocean Front Walk.

First Annual Venice Flute Festival, hear Argentinian jazz in a club, or enjoy the musicians' showcase at the Meatless Mess Hall (*i.e.*, vegetarian). Other artistic expression is even less structured. Murals appear almost overnight on blank walls of buildings. Street musicians draw large, enthusiastic crowds. Improvisational theater groups perform on the beach.

Peddlers and street artists set up their stands in the vacant lots among the small apartment buildings, restaurants, sidewalk cafés and shops along Ocean Front Walk. Marilyn Sitkoff, an outgoing 34-year-old curly-headed ex-teacher, sells paratrooper pants and brightly dyed surgical smocks from a red wagon with the help of her basset hound, Bagels. Bill Lombardi, a 35-year-old former social worker from Rhode Island, has Mexican sandals and baskets, and Roberta Mailman, a 26-year-old linguistics student, is known as Cactus Woman, because she sells only potted cacti.

But not all the street vendors are young people in their 20s and 30s who have dropped out. Ruth Clark is 51 and sells attractive old clothing. "We don't call 'em antiques," she says, "because we'd have to charge more money." Another Ocean Front regular is a spry woman in her 80s—"I am not going to tell you exactly how old"—known as the Doll Lady. In good weather, she brings two aluminum lawn chairs to Ocean Front Walk, one for her, the other for the large cloth Raggedy Ann-type dolls she makes and sells.

Feeling healthier by comparison

Other peddlers sell food, and the aroma of cooking hot dogs and hamburgers, Mexican tacos and burritos, soul barbecue and Texas chili fills the air along Ocean Front Walk. One young woman skates up and down the pavement in a satin T-shirt and shorts selling chocolate-chip cookies from a backpack. The Vegetarian Fast Food stand does a brisk business. For those less organically inclined, a man sells hot dogs from a truck that looks like a 15-foot-long frankfurter-in-a-bun on wheels (p. 119).

Ocean Front Walk also has its share of suntanned, windblown vagrants asking for spare change. Some are traditional big-city middle-aged winos. Others are young men and women who have used too many hard drugs. "No matter how sick, crazy, or screwed-up you are," one wild-eyed 30-year-old panhandler remarked, "you can come down here and find someone sicker, crazier, even more screwed-up, and you will see them and feel healthier by comparison."

Roller-skating, now endemic everywhere, was the biggest thing to hit Venice since the onslaught of bicyclists in the early '70s. It may well be the roller-skating capital of America. On weekends thousands of skaters jam Ocean Front Walk. Some skate up and

Harry Perry carries a guitar amplifier in his backpack.

Frowning unicyclist seems to show the strain of staying upright.

Self-styled Ex-Swami-X reads poetry, does monologues.

down the mile-and-a-half-long promenade for hours. Others carry portable tape players and disco-dance down the pavement on their skates. A few hold bubble-making devices and leave hundreds of soap bubbles floating in their wakes. On Saturdays and Sundays, skaters turn a section of the pavement into an obstacle course with empty soft-drink cans for markers. When the police aren't looking, some young men turn four or five garbage cans on their sides and jump the entire row just like Evel Knievel (p. 121).

At the beginning of the 20th century, Venice was the dream of a remarkable man, Abbot Kinney, who made his fortune with Sweet Caporal and other cigarettes (p. 116). Kinney was a Renaissance man, educated in Europe, fluent in several languages including Latin, and world-traveled. His interests and energy knew no limits. He was a respected botanical expert, art and music fancier, even an occasional public servant, and he shared his knowledge and concerns with the public. He wrote dozens of books and pamphlets on a variety of subjects: *The Conquest of Death, Forest and Water* and *Money*.

But handsome, bearded, piercing-eyed Kinney was a romantic as well. In 1904 he acquired 160 acres of marshland, 14 miles west of Los Angeles and overlooking the Pacific Ocean just south of Santa Monica. The worthless land reminded Kinney of the watery site of Venice, and he decided to build nothing less than a "Venice-of-America" on his land. In August, Kinney's workmen started to excavate tons of dirt and sand for the Grand Canal (now Grand Boulevard), which was half a mile long, 70 feet wide, and four feet deep. They then built an extensive system of 40-foot-wide, four-foot-deep canals several blocks from the beach,

Abbot Kinney, whose vision it all was.

Venice c. 1908. Coral Canal, in foreground, is now filled in. Cosmos Club was a bar-restaurant.

with Venetian-type bridges over them (above). The canal network tied into the ocean through two large pipes, so that the tides, in theory, would freshen the canal system twice a day.

Kinney built the handsome St. Mark's Hotel, loosely modeled on the Doge's Palace in the original Venice, at the northeast corner of Ocean Front Walk and Windward Avenue. He specified that nearby commercial buildings should imitate the same Venetian style with street-level arcades, elaborate ornament and pointed-arch windows. Then he built a 1,600-foot-long pier into the Pacific Ocean at the end of Windward Avenue, with the Ship Hotel and restaurant near the end. This structure, in a departure from his Venetian motif, resembled a Spanish galleon, but it rested securely on pilings rather than floated on the waves.

On June 30, 1905, Kinney's wife opened the floodgates and the empty canal network filled with seawater at the rate of 500 gallons a minute. Kinney then turned on the electric generating plant, and Venice basked in the glow of the 17,000 lamps he had installed along the streets, the pier and the canals. Gas lines and sewers were already in place.

On July 4, 1905, more than 40,000 people rode the electric railroad from Los Angeles to Venice for the grand opening—an astounding figure, because Los Angeles' population was only about 100,000 at the time. And the crowds loved what they saw: arcaded Venetian-style buildings, a 70-man orchestra playing at the end of the pier, and Italian gondoliers—imported from the real Venice—waiting to ferry wide-eyed visitors through the canals. (Today the gondoliers are gone and canal traffic consists mainly of resident ducks and participants in the annual build-your-own-vessel race.)

Kinney sold hundreds of lots for permanent homes and beach cottages that year, and prices weren't cheap. Lots sold for as much as $2,700, twice the average price in another new subdivision, called Beverly Hills, two years later. Venice was an immediate hit, but Abbot Kinney wanted his dream city to be more than just another stylish real estate development. He had a utopian vision that Venice might become the center of art and culture on the West Coast.

He built a 3,500-seat auditorium at the end of the pier for the Chautauqualike Venice Assembly. It was finished just in time for the start of the season. During the first year there were performances by the Chicago Symphony Orchestra, lectures by Helen Hunt Jackson, author of *Ramona,* and two days of Sarah Bernhardt performing three celebrated roles. This was a rich cultural offering, but the Assembly lost $16,000 its first season. Venice's summer residents and the thousands of daytrippers didn't share Kinney's enthusiasm for art and culture—at least not when Venice offered a mile-long beach, romantic gondola rides, and pleasant restaurants and beer gardens—all within a 25-cent railroad trip from Los Angeles.

Kinney was disappointed at the failure of the Assembly, but he knew when to quit. He canceled plans for the following year's program and stopped talking about founding a university on the edge of town. Now he began turning Venice into the seaside amusement park the public wanted.

Today, on one of the remaining canals, older house is sandwiched between new, expensive ones.

Fading arcade is a remnant of Kinney's fake Venice.

When the Lewis and Clark Exposition closed in Portland, Oregon, he bought most of the amusement rides and installed them as a part of a multibuilding Midway-Plaisance which he opened along Venice Lagoon in January 1906. After that he built Ocean Front Walk along the edge of the beach, and it was just as popular a promenade then as it is today.

By 1914, Venice offered something for everyone—band concerts on the pier, dances in the old Assembly hall, ten-cent camel rides, hootchy-kootchy shows in the Midway-Plaisance, even airplane barnstorming in the skies. In 1915 more than 60,000 spectators watched Barney Oldfield win the First Annual Venice Grand Prix, a 300-mile-long auto race through the streets of the town (because of the large number of accidents, it was also the Last Annual Grand Prix). Despite this honky-tonk atmosphere, Venice also became a respectable year-round community, and hundreds of middle-class families built comfortable homes close to the beach or along one of the canals.

Hollywood discovered Venice as a movie location. Silent-film directors in those days often shot their movies in authentic locations, and in 1914 Mack Sennett, creator of the Keystone Kops, heard about an upcoming children's auto race in Venice. This sounded like a wonderful opportunity for slapstick comedy, and Sennett told an unknown comedian he had just hired, named Charlie Chaplin, to go to the auto race and create as much confusion as possible for racing officials and the spectators.

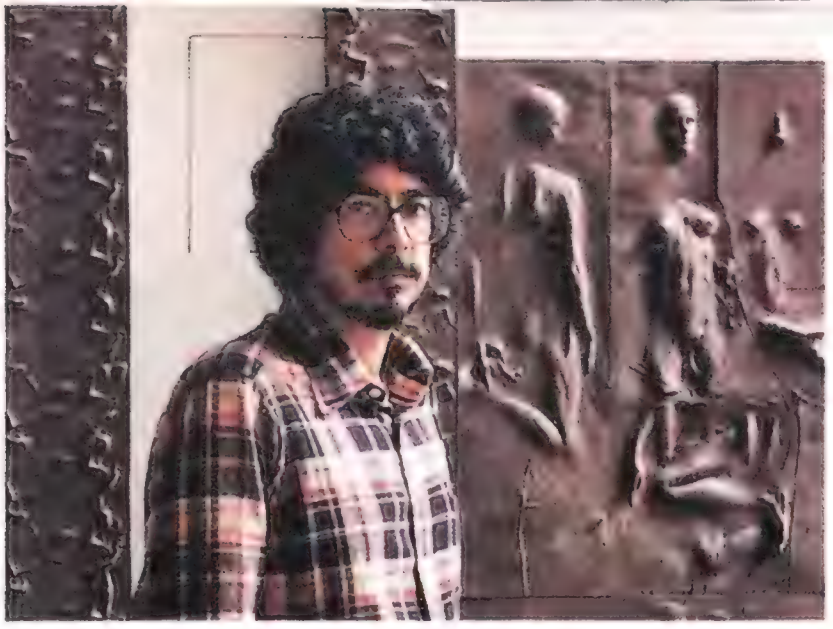
Chaplin wore a funny-looking costume to the races—pants several sizes too large, shoes too big and on the wrong feet, a too-small bowler hat and a false moustache. He improvised slapstick routines at the auto race for 45 minutes, and the result was an 11-minute comedy short entitled *Kid Auto Races at Venice*. This was the second film Chaplin ever made, and it was the beginning of his famed "Tramp" character.

Venice enjoyed its best years as a middle-class community and resort in the 1920s. But when Abbot Kinney died on November 14, 1920, much of Venice's optimism and spirit died with him. Fires and winter storms periodically damaged the pier and Midway-Plaisance; and the canals, it turned out, did not flush out, as anticipated, with every tide. They were filling up with silt, algae and even garbage.

Finally, scandals rocked the town government. Police, fire and sanitation services were inadequate. In 1925 Venice residents voted 3,130 to 2,215 to become a part of Los Angeles, with the hope, as one annexation supporter declared, to "generally drag poor, blessed Venice out of the gutter."

That did not happen. Community services remained as haphazard as ever. Los Angeles' one accomplishment was to fill in all of the seven original large canals. This outraged thousands of residents. When the first truck started dumping dirt into drained Coral Canal (now called Main Street), nearby residents jumped into the empty ditch and frantically shoveled dirt out as fast as it poured in. But their anger was futile. Several months and 80,000 cubic yards of dirt later, all of the canals lying north of Venice Boulevard had vanished.

Shortly after the canals were destroyed, Venice suf-



Among artists who have been moving into Venice in recent years is sculptor Robert Graham.

Actor-producer Tony Bill renovated a building that was on its last legs for his offices and apartment.

DeWain Valentine creates "installation sculpture," geometric constructions of thin strips of glass.

fered another, even more serious, blow to its distinctive charm. On December 18, 1929, the Ohio Oil Company struck oil on the southern edge of the community. Two years later, some 300 oil wells were pumping noisily away. Entire streets vanished under a forest of wooden oil derricks, and a grimy film of oil coated Venice's bungalows and palm trees. Tourism dropped, and middle-class families started fleeing the town. Venice was well on its way to becoming a picturesque seaside slum.

Plenty of people, however, were more than happy to move to Venice—retired couples on small fixed incomes (many had been garment workers in Los Angeles), and black and Hispanic families from the downtown Los Angeles ghettos. Although housing was decaying and the beach was closed because of raw sewage pouring into the ocean, these newcomers had found a comfortable, cheap, safe place to live.

Beatniks, hippies and flower children

But tranquility was not one of Venice's virtues, particularly in the blocks near the beach. During the late 1950s, Venice—or Venice West, as it was called—had become Southern California's Beatnik capital. Venice's "squares" were horrified. They had always tolerated some eccentricity in their community—they really didn't have much choice—but the Beatniks had gone too far. The Venice Civic Union was formed to clean up the town, and in 1962 the City of Los Angeles condemned the St. Mark's Hotel and the Gas House —a raunchy hangout where the habitués sat on pillows on the floor or in one of the bathtubs scattered around the main room, rapping endlessly, playing bongos and smoking dope. Safety officials tore down the Gas House early one Sunday morning without going through the lengthy and public process of obtaining a demolition permit. Despite this continuing harassment, the Beatniks did not disappear until their movement ran out of momentum in the mid-1960s.

By then hippies and flower children were moving into the hotels and apartment buildings along the beach, into the run-down and unheated shacks along the silt-filled canals, and even into long-empty storefronts on decaying commercial streets. Venice was becoming a depressing and dangerous place to live for the first time.

Still the pervasive decay, the down mood and the burnt-out men and women could not totally obscure Venice's undeniable charm. Actually, it had become the most romantic spot in Southern California. The half-gone, gap-toothed Venetian arcades, the crumbling sidewalks and decaying bridges along the canals, even the algae-choked, half-empty canals themselves—all these had an appalling yet quite picturesque

beauty in a plastic, fast-moving Los Angeles, where charm was something manufactured for amusement parks or "Olde English" restaurants.

"That's when I moved to Venice, when it was really down and out, about five years ago," recalls 39-year-old Tony Bill (opposite) at his production office 73 Market Street, a few hundred feet from Ocean Front Walk. "I'd never lived there, but I knew plenty of artists and writers who did, and the community suited my tastes. The air was clean. I was stimulated by the many interesting people, the variety of people. And Venice was close to my sailboat. Then I discovered that some of my Hollywood and Beverly Hills friends wouldn't visit me here. Too dangerous, they said, and they may have been right."

All that has changed. Artist DeWain Valentine works next door; Robert Graham, the sculptor, has his studio around the corner (both opposite). Across the street, the Ace Gallery shows Robert Motherwell, Andy Warhol and Robert Rauschenberg. Actor Richard Dreyfuss has opened a production office down the block. Although belatedly and in an altered form, Abbot Kinney's dream of Venice as a cultural center may be coming true.

The improvement boom

Tony Bill's block of Market Street is just one sign of the vast and rapid improvements now sweeping Venice, particularly the blocks near the beach. Venice is the last chunk of low-rent ocean-front real estate in Southern California, and its Bohemian days are numbered. By 1979, dozens of stylish restaurants, antique shops, and art galleries had opened along Main Street in Ocean Park, a little community between Venice and Santa Monica. Main Street, though not actually a part of Venice, has become a Los Angeles version of San Francisco's Union Street or Washington's Georgetown. Sleek, affluent-looking people from Beverly Hills or Marina del Ray, who wouldn't have dreamed of setting foot anywhere near Venice a year or two ago, can't find empty parking places for their Mercedes and Porsches along Main Street most nights of the week.

The improvement boom has spilled over into West Washington Boulevard, which is the dividing line between the ocean-front community and the black and Hispanic neighborhood of Oakwood. One of West Washington Boulevard's best-known personalities and symbols of the old, pre-chic Venice is Rose Cline, who runs the U-Need-It Shop on the block just north of Venice Boulevard. Rose is a free spirit—short, suntanned, feisty, sixtyish—and her shop is a fixed-location, seven-day-a-week garage sale. "I've got the entire Yellow Pages here," Rose says with a smile. "There's nothing I won't buy, and nothing I won't sell."

There's entertainment on both sides of the window at popular, inexpensive Figtree's Coffee House.

Mobile fast-food stand in the shape of a giant hot dog also proclaims its product on license plate.

Terra Jennett airbrushes designs on clothing. She also wears airbrushed roller skates, unseen here.

For all her eccentricities, Rose Cline unwittingly is one of the most astute businesswomen in Venice. By buying and selling used merchandise for the last 15 years, she has acquired half a dozen adjacent buildings and vacant lots on an increasingly valuable street.

All this recent change and upgrading in Venice has given affluent Angelenos a new place to play, but the escalating rents have inflicted terrible hardships on the aged and the poor in the community. "I've lived in the same one-bedroom apartment on Sixth Avenue in Venice since 1959," says Esther Gilman, a handsome gray-haired widow in her early 80s who has a warm smile and walks with a cane. "But I don't know how much longer I'm going to be able to stay here, because the landlord keeps raising the rent." But she can't find anything she can afford, because one-bedroom apartments, like her own, rent for $400 to $500 a month. So Esther has applied for an apartment in one of two subsidized buildings for the elderly in Venice. The two buildings have a total of 110 units. The local waiting list has 4,000 names.

"The last decade has seen the decimation of the elderly Jewish community in Venice," declares Morrie Rosen, the articulate and earnest director of the Israel Levin Senior Adult Center at 201 Ocean Front Walk (p. 112). "Their population has dropped from 16,000 in the mid-1960s to less than 2,000 now, partly through deaths, but mostly because of rising rents and real estate speculation."

Every day hundreds of these older residents come to the Israel Levin Center for a hot lunch, weekend dinners and entertainment, or outings to museums and concerts. The average age of the 750 members is about 80. Regina Bock, a 72-year-old tailor's widow who has lived in Venice since 1940, is one of the regulars. "This is a lot better than sitting alone at home watching television or reading. I have lunch, see some friends, maybe meet some new people. This is the last place in Venice for people like us."

Regina Bock may have accepted many of the changes in Venice, but most of the elderly feel disoriented and out of place, because so many friends, synagogues and familiar shops are gone. Now they face physical danger as well, not from muggers, but from reckless roller skaters and others. "Whenever I go on Ocean Front Walk," Regina says, "I walk next to the buildings and look out for roller-skaters and bicyclists. You could get killed." She knows what she's talking about. On June 10, 1979, a 25-year-old bicyclist, who swerved to avoid a skateboarder, ran into 86-year-old Ann Gerber as she crossed Ocean Front Walk. She was thrown to the pavement and died of a fractured skull.

Callous disregard for the very old, the very young and the defenseless is the problem of Venice today. The much-maligned single-class, single-age postwar Southern California suburb is emerging in a different, much trendier guise in Venice, and the elderly, the not-so-middle class, and the genuinely eccentric have no place in this new vision of a cleaned-up 1980s urban America.

At this moment, Venice is poised between its free-spirited, creative, often down-and-out recent past and an uncertain but obviously more affluent future. This unstable mix of the past and the future creates the tension that gives Venice so much of its energy and its magic today, but it is a fragile synthesis, and Venice may well be quite a different place in just a year or two.

Employees of a local roller-skate shop cool off at an outdoor shower in the Venice Pavilion.

Airborne roller-skater takes off over hurdle of garbage cans, a feat discouraged by police.

University Gallery, University of Minnesota

By Piri Halasz

The moody work of a lonely painter is now reassessed

Pioneer American modernist Marsden Hartley searched restlessly for inspiration in Europe, but his art finally came to full fruition at home

National Gallery of Art, Washington

Marsden Hartley sat for this portrait by the master photographer and art dealer Alfred Stieglitz in 1915.

When Marsden Hartley, sometime poet and full-time painter, died in his native Maine in 1943 at the age of 66, he left only $500 in cash and $10,000 in savings. However, measured in other ways, the hope that he felt on returning to Maine had been amply fulfilled. By coming home in his old age, after decades of restless peregrination, to depict the Atlantic coast's lost sailors, seas, coves, gulls and mountains, Hartley recovered the power and freshness that marked his painting in the early years of the century.

In his youth, Hartley had been one of America's most brilliant pioneer modernists; he was a member of that select group of artists discovered and vigorously promoted by Alfred Stieglitz, who—in addition to being a phenomenal photographer—also ran America's first gallery of modern art. Yet the vicissitudes that marked Hartley's later life have also dogged his posthumous reputation. Other artists of the Stieglitz group —which included John Marin and Georgia O'Keeffe— have been the subject of major books and exhibitions. Hartley has been neglected.

Now, however, Manhattan's Whitney Museum of American Art is showing "Marsden Hartley," an exhibition of 105 paintings that span Hartley's career. The exhibition was organized and the catalog written by Barbara Haskell, curator of painting and sculpture at the Whitney, with the aid of grants from the National Endowment for the Arts and the museum's 50th Anniversary Exhibition Fund. After the show closes at the Whitney on May 25, it will go to the Art Institute of Chicago, June 10 to August 3; the Amon Carter Museum, Fort Worth, August 28 to October 19; and the University Museum in Berkeley, California, November 12 to January 11, 1981.

"Marsden Hartley" abundantly documents the artist's remarkable range and vitality. At the same time, the show indicates the reasons for his failure to capture public favor during his lifetime. Witty and charming in conversation but often blackly moody, Hartley made enemies as well as friends, and his artistic development was chameleonlike. As Haskell observes, "Early in his life, he developed a penchant for solitude and a simultaneous desire for crowds—mutually exclusive needs which created a rootless personality. His restless nature can be seen in his art as well; it led to frequent style changes, often the result of seeing others' work, often a reaction to new geographic stimulations, and just as often an attempt to find personal approval and affection—needs which are demonstrably products of his childhood experiences."

Hartley's iconographic homage to a departed friend, *Adelard the Drowned, Master of the Phantom,* 1938-39.

University Gallery, University of Minnesota

Obviously much under the influence of Cézanne, Hartley painted *Still Life* in Paris, in 1912.

Hartley's given name was Edmund. He was the youngest of nine children, and the only boy, born in 1877 to an English immigrant and his wife in the mill-town of Lewiston, Maine. Hartley's father earned a meager living as a cotton spinner. Only four of the artist's sisters lived to maturity. The boy's mother died when he was eight. Unable to cope with the three small children who were still at home, the father sent the two girls to a sister in Cleveland. Then he remarried and moved with his bride to Cleveland, too. Edmund was left behind with a married sister, in Auburn, Maine. In order to contribute to the family income, he quit school at 15 and worked for $3 a week in a shoe factory. The next year, when he joined his father in Cleveland, he again went to work for $3 a week, as a messenger in a marble quarry.

He began taking painting lessons and soon won a scholarship to the Cleveland School of Art, where a sympathetic teacher gave him a copy of Emerson's *Essays*. Hartley was fired by Emerson's intuitional approach; it was to provide the artist with the basis for his own mystical philosophy. In 1899, Hartley went to New York, where he studied art with the courtly and flamboyant William Merritt Chase. The young man later transferred to the more conventional, less expensive National Academy of Design. Summers were spent in Maine, and he adopted his stepmother's maiden name, Marsden, in place of Edmund. By 1908 he had developed his first mature style, based on the "stitch" technique of the Italian Neo-Impressionist Giovanni Segantini, whose work Hartley had seen reproduced in a German magazine. Hartley applied bright daubs of paint to create tapestrylike scenes of the heavily wooded Maine hillsides. "Mountains," he felt, are different in that they "are things, entities of a grandiose character, and the one who understands them best is the one who can suffer them best and respect their profound loneliness."

In New York, he took the pictures to Stieglitz' 291 gallery. Stieglitz was moved by the work, and by Hartley's insistence that he wanted to show at 291 or nowhere. The gallery gave the fledgling painter a one-man show in May 1909, and he was adopted into a new, cosmopolitan circle that included not only Marin but also such daring younger artists as Arthur B. Dove and Max Weber (O'Keeffe, who was later to marry Stieglitz, had not yet joined the group). Hartley was also able to study the latest in transatlantic styles, for Stieglitz exhibited Picasso, Matisse and Cézanne—artists whose work at that time could be seen in no other American gallery or museum.

Hartley went through a Matisse phase, then a Picasso period; last and most fruitful was a stage influenced by Cézanne, during which the young American turned to gracious still lifes that echoed the Frenchman's architectonic structure. "There were in Cézanne the requisite gifts for selection, and for discarding all useless encumbrance," Hartley later wrote. "There was in

Piri Halasz, a former art critic for Time, *now teaches art history at Columbia University. She wrote on Edvard Munch in December 1978.*

Whitney Museum of American Art

In Germany Hartley used military symbols in *Painting No. 5*, 1914-15, in Cubist style developed by Picasso.

him the great desire for purification, or of seeing the superb fact in terms of itself, majestically; and if not always serenely, serenity had nevertheless his passionate longing."

Stieglitz arranged to send Hartley to Europe in the spring of 1912. In Paris, he galloped through the museums and galleries, congregated with American artists in the cafés, and speedily won entrée to the glittering salons held by Gertrude Stein and her brother Leo at 27 rue de Fleurus, where the walls were hung with the works of major moderns, and the chairs below might just as likely seat the moderns in question. Hartley's closest friendships were formed with a group frequenting the Restaurant Thomas. Here he met the American painter Charles Demuth, and more importantly two Germans, a sculptor named Arnold Rönnebeck and his handsome young cousin, Karl von Freyburg, a German army officer.

After developing his still lifes until they possessed a special decorative quality, Hartley also turned to painting with a more Teutonic inflection. He had been delving into the writings of German Expressionism, especially those of the Russian-born Wassily Kandinsky. Kandinsky argued that art was moving toward greater freedom, but that it would be charged with spiritual urgency. This chimed in with Hartley's own transcendentalist approach; his pictures became both more abstract and more electric. The basic pictorial vocabulary was that of Picasso's Cubism, but enlivened by whorls and arcs of bright colors owing something to Kandinsky.

Hartley finally met Kandinsky and his mistress, Gabrielle Münter, in Munich, but Berlin was the city that enthralled him. He liked the neatness, cleanliness and *Ordnung*—everything his helter-skelter way of life had hitherto lacked.

At home in Berlin

The Kaiser's capital witnessed daily parades of magnificently clad soldiers; Hartley could lose himself in the pageantry. He also felt at home because Berlin possessed a large homosexual subculture. Hartley said that he "lived rather gayly in the Berlin fashion—with all that implies." His friendship with Rönnebeck and Lieutenant von Freyburg ripened into what Hartley described as a "beautiful triangle" (though Hartley's favorite seems to have kept him at a distance; von Freyburg, in his letters, always addressed the artist as "Mr. Hartley").

However unorthodox, Hartley's Berlin experience strengthened his painting. His new canvases, while still abstract, were better organized, and incorporated the eight-pointed star he had seen on the Kaiser's chest with other military imagery. Numbers and color also carried arcane symbolic meanings. Summoned home by Stieglitz in the fall of 1913, Hartley exhibited his Paris and Berlin abstractions at 291 to critical acclaim. The show generated enough sales to allow the artist to return to Berlin, and he plunged into work there.

History intervened. Germany declared war on France and Russia; war became "not a romantic but a real reality." Hartley's beloved von Freyburg was killed in action. For a month, the artist was too disconsolate to paint. Then he executed an extraordinary series of memorial pictures, the War Motifs, expressing at once his grief and his fascination with the power of the military. *Painting No. 5* (at left) is one of these. Hartley had integrated the flat, fragmented forms developed by the Parisian Cubists into a dynamic, flaring emblem whose coarse textures and savage hues combine Gallic wit with German intensity. It was of this Hartley period that Georgia O'Keeffe was later to write, ". . . in 1916 I went in alone to see the Hartley show. It was his war pictures and was like a brass band in a small closet."

Forced by food shortages to return to New York, Hartley found himself very much alone. Anti-German sentiment was so strong that even performances of Mozart and Beethoven were banned. Hartley exhib-

ited his latest Berlin works at 291, but was forced to state that "There is no hidden symbolism whatsoever in them." Their reception was disappointing.

Hartley spent the summer of 1916 in Provincetown, Massachusetts, as the houseguest of John Reed (Reed had not yet written his famous *Ten Days That Shook the World,* but already stood well to the left of center; Hartley was nothing if not apolitical). Also in Provincetown were Demuth, and a budding playwright named O'Neill. Striving to purge himself of German content, Hartley executed very pure abstractions. He and Demuth went down to Bermuda for the winter, and there Hartley began to work in a more representational manner, with tranquil, rather Matisselike still lifes. "I weary of emotional excitement in art," he wrote to a friend.

Stieglitz had closed 291, and Hartley felt cut adrift. In 1918 he tried Taos, New Mexico, but loathed the local artistic community (saying that "Taos" should be spelled "chaos"). The spectacle of Indian dances intrigued him, however, as did the canyons and arroyos.

Eager to get back to Europe, Hartley turned once again to Stieglitz, who arranged an auction of the artist's work that netted nearly $5,000. Two hectic years in Berlin followed. The postwar city was even more abandoned than the prewar one had been, and Yankee dollars went a long way in the inflation-wracked Weimar Republic (Hartley paid 1,000 marks for one outfit for a costume ball). But from the easel emerged strange, dark, distorted still lifes.

After some travel, seeking fresh inspiration, Hartley fled in 1926 to Cézanne's birthplace, Aix-en-Provence. With two cocker spaniels, he moved into one of Cézanne's former studios, and applied himself to one of the master's favorite motifs, Mont Sainte-Victoire.

Hartley returned to the United States in 1930, to find that his reputation had plummeted. Though Stieglitz had opened another gallery, and exhibited

Back in America, Hartley painted *Landscape, New Mexico* in 1919-20, before returning to Europe.

Whitney Museum of American Art

There, in southern France, he began a series of paintings

Hartley's paintings there in the artist's absence, critics had damned the new work as "academic," and suggested that Hartley had lost his identity from remaining so long abroad. Even Stieglitz looked on him with less favor.

Often ill, Hartley found himself scrabbling for a living. At one point he was forced to destroy more than a hundred paintings and drawings, for lack of funds to store them; he contemplated suicide. He tried a season in New Hampshire, but the turning leaves weren't as bright as he remembered; he spent a year in Mexico, on a Guggenheim Fellowship (hypnotized, as always, by mountains, he painted Popocatépetl). Revisiting Germany, he limned bizarre, mysterious vistas of the Bavarian Alps, but his nearest approach in spirit to his native soil came during the two summers he went alone to Gloucester, Massachusetts, which seemed to Hartley "a cross between Easter Island and Stonehenge." If the subject was engaging when Hartley visited it, it proved even more so in retrospect, after the artist went to Nova Scotia in 1935.

There he met Francis Mason, a fisherman and boat builder, and his family. On the offshore island of Eastern Points, the Masons boarded Hartley for $7 a week. Hartley was tremendously touched by the simple piety and kindliness of the Masons, their two daughters and one son, Donny, but he was even more attracted to the other son, Alty, 31, a brawny 210-pounder with a shock of wiry black hair. "There is a touch of Christian martyrdom about the life anyhow, for they endure such hardships and hate any show of cheap affection," he wrote to a friend. "All this vital energy and force. . . . I have never been so near the real thing before."

With a new zest for living, Hartley went back to New York for the winter, to paint exuberant flower fantasies for the WPA. He returned the following summer, and the Masons welcomed him, especially Alty. Then, in September, Alty, his brother Donny and a cousin set out from the mainland for Eastern Points in a punt, and were lost in a storm. The grief-stricken family asked Hartley to stay on for a few months. He did, but wrote to Rönnebeck that "life here has been made empty, without the boys. I haven't felt anything like it since the death of Karl von F."

Again, Hartley sought to express his feelings in his paintings—sorrow, but also awe at the natural forces responsible for the tragedy. Vehement seascapes resulted, in the tradition of Winslow Homer, but more particularly that of Albert Pinkham Ryder, whom Hartley had met when he was still young, and whose work had impressed him as powerfully as "a page of the Bible." When Hartley's seascapes were exhibited, in his last show with Stieglitz, the artist declared in the foreword to the catalog that he was a painter from Maine. "This quality of nativeness is colored by heritage, birth, and environment. . . . And so I say to my

of Cézanne's famous motif, Mont Sainte-Victoire, this one in 1927.

Mr. and Mrs. Harry W. Anderson

In 1936, in Nova Scotia, Hartley recalled New England in spare, strong works like *The Old Bars, Dogtown.*

Whitney Museum of American Art

native continent of Maine, be patient and forgiving, I will soon put my cheek to your cheek, expecting the welcome of the prodigal. . . ."

And return to Maine he did—not exclusively, but for summers and sometimes winters (whenever he was not in New York). He spent a year in Portland and Georgetown, a summer on Vinalhaven, passed time in West Brookville and Bangor, and finally, in 1940, found a sympathetic couple in the lobstering hamlet of Corea. Until he died, Forest and Katie Young played for him the role of adoptive parents.

The last years were fecund. Two volumes of poetry were published, and Hartley's canvases again began to find good reviews and good prices. Landscapes celebrated craggy shorelines and bristling spruce with easy brio, while in Hartley's still lifes he brought vigor and pathos to poignant maritime details: dead gulls, fish, roses, lobster pots, coils of rope and seashells.

Alty Mason and his family were memorialized in what the artist called "Archaic Portraits." Austere and dignified, these richly enigmatic icons are replete with hidden Christian symbols. Hartley also did other remarkable "dream portraits," including one of Ryder, "majestic in his grey wools," with his "heavy mustache, and long flowing beard, all lichen gray," and several of Lincoln, based on Mathew Brady photographs.

At the age of 62 and in poor physical condition, Hartley also made an arduous eight-day trip to the hinterland to view Maine's highest mountain, Katahdin. His memories gave birth to a trenchant series of that peak in all seasons and times of day. After all, he said, Hiroshige did 80 woodblocks of Fujiyama, so why couldn't he do 80 Katahdins—and each time he felt "nearer the truth, even more so than if I were trying to copy nature from the thing itself."

Thus, in the end, Hartley's visions of Maine turned out to be both outer and inner. They are intense tributes to the stern loveliness of the countryside, but also documents of the uneasy peace found by a weary and wiser traveler.

His style now pared down to the bare bones of the elemental in art, Hartley painted *Fox Island, Georgetown, Maine* in 1937-38. It is representative of the final elegiac works of an American master.

Addison Gallery of American Art

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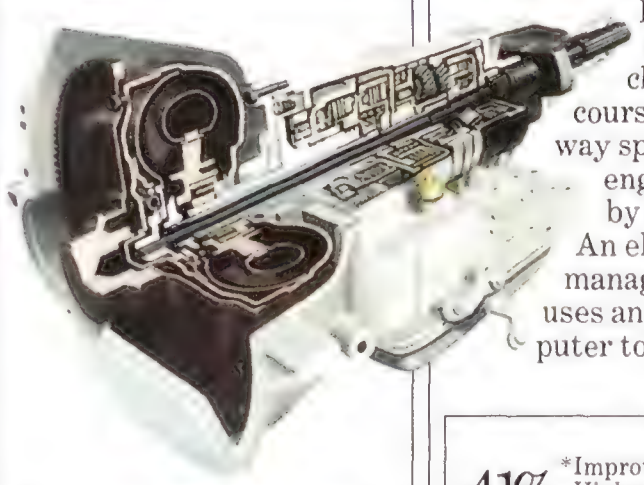

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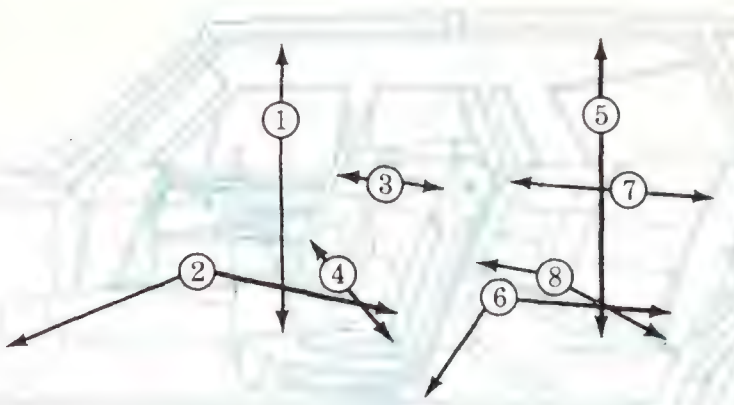
4. Front hiproom	56.5″	8. Rear hiproom	57.8″



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This 1787 Brasher doubloon with "EB" on the eagle's wing brought $725,000.

By Percy Knauth

Coins go up, up as fabled collection is sold at auction

A gleaming hoard of hard currency has been put on the block, and it's sending numismatic pulses sky high

Gold and silver gleamed in the light of a small desk lamp one day last August. On the polished table lay a square of jet-black velvet. On the velvet, sharply outlined in the light, were two coins. Their combined value, as it turned out, was more than a million dollars.

A finger carefully separated the coins, gold, obviously very old. They showed on their faces a mountain rising from the sea with the sun's rays behind it. The words "Nova Eboraca Columbia Excelsior" around the rim testified that these coins were minted in New York. Below the mountain was the name "Brasher."

The other side of the coins displayed an astonished-looking eagle. On the right wing of one appeared an oval with the initials "EB" stamped inside (above). The other specimen carried the "EB" on the eagle's breast.

"These are probably the most valuable coins in the world," said the cool, flat voice of the expert. "They are known as the Brasher doubloons, minted in 1787 by a well-known New York silversmith who lived next door to George Washington on Cherry Street. There are only six of these coins in existence, as far as we know—and one of them was found in a Philadelphia sewer by laborers late in the 19th century."

The voice pointed out that there is considerable speculation as to why the

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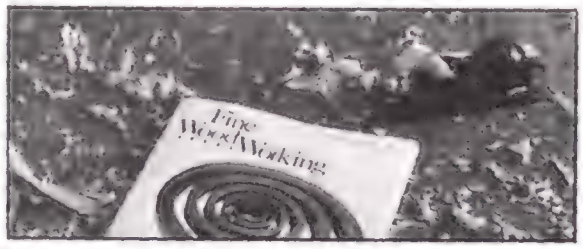

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Deeply sculptured $20 gold piece with a striding Liberty, designed by Augustus

coins were ever minted, although Brasher is known to have been interested in striking coins for the state of New York. These coins were valued at about $16 each at that time. Last July another specimen of the Brasher doubloon sold for $430,000, the highest amount ever paid for a coin at public auction up to that time. The voice continued: "The value of these coins, one of which is unique and the other of better quality than the $430,000 specimen, may exceed $500,000 each."

There was silence, for those in the room were sharply aware of the fact that this might be the last time these coins would ever be seen together again. What they were inspecting on the jet-black square of velvet was the golden heart of one of the most remarkable collections of coins the world has ever known, the Garrett Collection. Last November, in the first of four sales, a part of the collection was put up for auction. One of the Brasher doubloons was sold for $725,000!

Other extraordinary coins were displayed before the November auction. One, in gleaming, sculptured gold, showed a striding Liberty, head high, long gown swirling. Her right hand, outthrust, held a flaming torch; her left gripped an olive branch. Under a magnifying glass her face stood out in sharp detail, etched in determination below her flowing hair. By her left foot were the letters MCMVII.

Free-lancer Percy Knauth's books cover everything from private flying to the funny side of retirement (due next fall).

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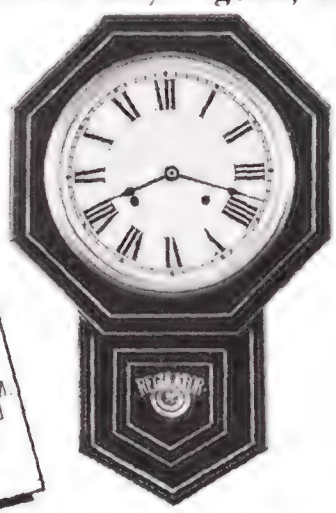

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Saint-Gaudens, is rated most beautiful U.S. coin. It is to be auctioned this month.

"This is a 1907 $20 gold piece," the numismatist told us, now with a hint of emotion. "It was designed by Augustus Saint-Gaudens and is considered America's most beautiful coin. It is not a Proof coin—that is, one that is struck from a special die to attain the sharpest and clearest imprint possible, and to go to a collector or possibly to the director of the Mint. This is a regular commercial strike, designed to go into circulation, although this specimen never did. Few coins minted have ever been so deeply sculptured, with such beautiful detail. We cannot know its current value until someone bids for it and wins it. It may sell for more than $20,000, perhaps a great deal more."

Nearby, an 1827 quarter, this one a Proof coin, was described as "one of the most desirable of United States coins." Then there was a strange piece, octagonal, as solid looking as a gold bar. This coin was 925-thousandths fine, as attested to on the face: 21 carats—almost pure gold. It was mined and melted in the California gold fields, minted in San Francisco about 1851.

"This coin," said the quiet voice, "is the only known one of its kind. It belonged to Augustus Humbert, the United States Assayer in San Francisco at the time of the first gold rush. It was an experimental piece—gold so pure is too soft to circulate—and its face value was then $50. Its present value is probably more than $100,000."

Owned by The Johns Hopkins University, the Garrett Collection was entrusted for auction to the Bowers & Ruddy

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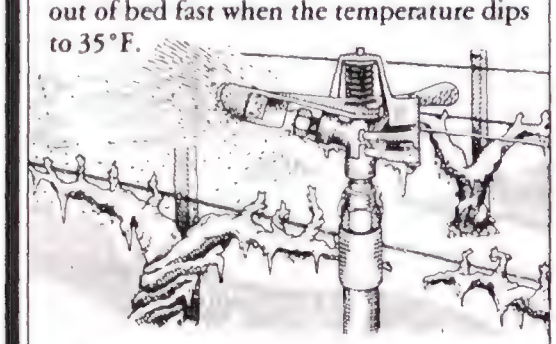
The greatest concern of the spring season, however, is the everpresent threat of a killing frost. If the budding grape vines are frost-burned, only a partial crop may develop or even no crop at all. My Dad calls this "the season of long days and short nights," because we are constantly alert for the frost alarm that gets us out of bed fast when the temperature dips to 35°F.



Overhead sprinkler systems are then turned on. Newly forming shoots which will eventually become grapes and leaves are showered with a fine mist that continually forms ice around the tender shoots as the temperature drops below 32°F. Water gives off heat when it freezes and the temperature of the shoots remains at 32°F as long as the misting continues. This protects the shoots from frost damage which would occur at 28°F and below.

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Baltimore merchant T. Harrison Garrett started collection while at Princeton.

Galleries, Inc., of Los Angeles, and the voice describing the coins belonged to Dr. Richard Bagg, one of their numismatists. The collection was begun in 1865 when its creator, T. Harrison Garrett, was a college student, and was continued by two of his sons. With more than 2,000 rare American coins in its inventory, it became one of the most impressive collections of U.S. coins ever assembled. Its range is extraordinary. At the other end of the scale from the opulent Brasher doubloons is a 1909 Lincoln penny, as plain and austere as the man in whose memory it was designed, yet valuable for the fact that it is one of only 420 Proof coins issued by the Philadelphia Mint with the initials V.D.B. embossed on it, signifying that its designer was Victor D. Brenner. Its current value is approximately $700.

Garrett, third-generation son of a wealthy family of Baltimore commission merchants and bankers, conceived his passion for coins from the moment he first saw an old and rather rare New Jersey copper while he was at Princeton. He began collecting forthwith.

In 1883 he bought an Extremely Fine 1804 silver dollar for $740, a huge sum in numismatics in those days. This singled him out as a serious collector with the means to get what he wanted. He enlarged his collection when he bought some of the holdings of Lorin G. Parmelee, a Boston druggist who was a major figure in numismatics, and absorbed them into his own. He subsequently bought the collection of New Jersey copper coins assembled by Dr. Edward P. Maris, author of the standard reference work on these coins, as well as a rare collection of "Hard Times" tokens, a substitute for minted coins issued in the "Hard Times" era of 1832-44. These had been assembled by Lyman H. Low.

In 1888 Garrett, aged 39, was tragically swept overboard and drowned when his yacht *Gleam* collided with the steamship *Joppa* while on an afternoon cruise in Chesapeake Bay. The coin collection languished in a vault for 15 years. Then his son Robert took it up. Robert is best remembered as the winner of the first American gold medal in the revived Olympic games: in Athens in 1896 he took the classic discus throw.

Robert was an active guardian of the collection, and on one occasion unwittingly saved it from certain destruction. In late January 1904 he had it transported from the vaults of the Continental Building in Baltimore to Princeton to be put on display. A few days later the Great Baltimore Fire of 1904 reduced the Continental Building to a blackened, gutted shell. The few coins left behind were found in the ashes of the vaults—melted, unrecognizable globs of metal.

Robert Garrett made some additions to the collection, but his heart lay in art and archaeology. In 1919 he traded the coins to his brother John Work Garrett for some Oriental art, and the Garrett

John Work Garrett built collection into finest of its kind, willed it to Hopkins.

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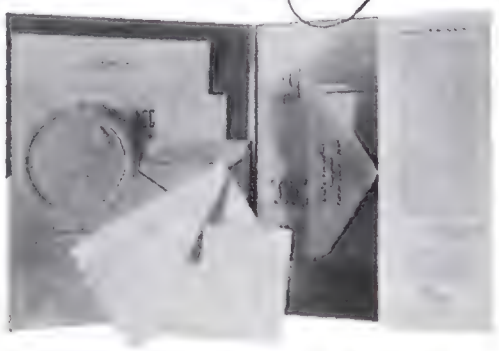

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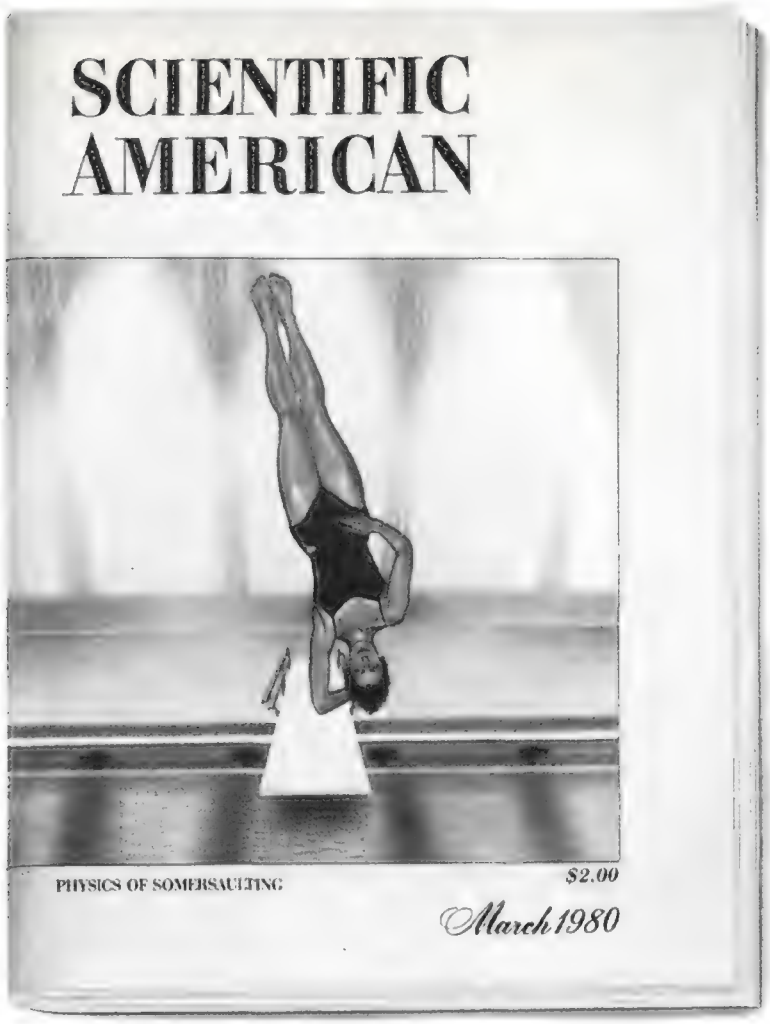
Collection entered upon its golden age.

John spent his professional life in the U.S. Foreign Service, residing in many different parts of the world and becoming, in 1929, American Ambassador to Italy. During all these years he indulged a passionate interest in coin collecting no less avid than that of his father.

In 1923 he shared with a New York dealer the purchase of the James W. Ellsworth Collection, which came on the market for $100,000. The *New York Times* called this "the most important set [of early American and U.S. coins] ever sold here." Throughout the 1920s and '30s John Work Garrett continued to add to the collection.

John's wife, Alice, meanwhile was turning the family mansion, Evergreen, into a Baltimore cultural center. A new library was added. An admiring patron of modern art, Alice Garrett corresponded



Do divers and gymnasts violate the law?

We are accustomed to seeing divers and gymnasts begin to twist and somersault long after they have left the springboard or the floor. Indeed, in order to win gold medals divers need to perform such complex feats in midair as the forward two-and-a-half somersault with two twists. But, you may ask, doesn't this violate the law of conservation of angular momentum? It postulates: *In the absence of torques, or rotational forces, the angular momentum of a body is conserved.* In the March SCIENTIFIC AMERICAN you will see how this paradox is resolved. You may be relieved to learn that divers and gymnasts (and free-falling cats, too) perform their midair rotations without violating any laws of physics. Moreover, the underlying physics is the same for the astronauts in space who need to control their body orientation in a weightless environment.

In the same issue you will find that impaired communication among cells can be a cause of a variety of diseases, as widely different from each other as cholera, diabetes and manic-depressive psychosis. In each there occurs a form of failure of fit between signal-bearing molecules from one cell and the receptor molecules in the outer or internal membranes of the target cell.

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regularly with Dufy and Léon Bakst and hung many of their works in her rooms, along with paintings by Utrillo, Modigliani and Bonnard.

John Work Garrett and his wife had no children, and so the question arose as to who would inherit Evergreen and its contents—including the coin collection. Robert had donated his notable assemblage of art to Princeton. John willed Evergreen House, the coin collection and his library to The Johns Hopkins University in Baltimore; Alice, her works of art and money to maintain the mansion to the Evergreen Foundation. John died in 1942, Alice in 1952, and the university and foundation took possession. Parts of the Garrett Collection, the most complete and most nearly perfect assortment of Colonial, territorial and U.S. coins ever assembled, have been displayed since at Evergreen House.

But as the years went by, forces conspired against its continuing existence as a collection. With each year its value grew, and with each year insurance rates to cover it against theft and destruction went up. With inflation, the cost of guards and security systems required to protect it also increased, until finally the expense of taking care of this by now legendary hoard was prohibitive. In the long list of Johns Hopkins' educational responsibilities, numismatics had a rather low priority: the money could be used for more important things. Early last year it was decided to sell the collection at auction.

Nobody questioned the belief held by Johns Hopkins' trustees that this would be the most important numismatic auc-

tion of this century. It would certainly draw bidders from all over the world, and its preparations and the actual event itself could only be entrusted to an organization whose numismatic knowledge, depth of experience in grading and evaluating coins, and, above all, integrity and honesty could not be challenged. The decision was made to commission Bowers & Ruddy Galleries of Los Angeles to conduct the auction.

Bowers & Ruddy is not among the oldest rare-coin dealers in business today: only a year ago it announced its 25th anniversary. Yet it is among the largest and most prestigious in the world, with a staff of 60 people, among them nine professional numismatists, occupying a large suite of offices on Hollywood Boulevard.

The Bowers & Ruddy firm started out small. James H. Ruddy, a physicist at the Ansco corporation, had left his job to set himself up full time as a free-lancer in his favorite hobby, coin dealing. Jim Ruddy did so well he moved his office out of his home in Johnson City, New York, into an office building on Main Street.

Finding the value of a coin

At about this same time Q. David Bowers was a 14-year-old high school student in a nearby Pennsylvania town. He was an ardent rockhound and was suddenly converted to coins when he saw his first 1909-S (for the San Francisco Mint) V.D.B. Lincoln penny. David was particularly impressed by the fact that the owner had paid $10 for it (today, in the best Uncirculated grade, it is worth $500). In 1958 Bowers and Jim Ruddy, who had become fast friends, joined forces.

Numismatics, an old, old activity which for many years was restricted to kings, noblemen and the very rich, is gaining popularity as coins gain in value. What makes a coin valuable? It is more than age; it is also condition. There are no fewer than 15 grades of excellence recognized by the American Numismatic Association, ranging from Proof, the mirror-like finish of a coin that was specially manufactured by the Mint and carefully preserved ever since from any nicks or scratches, down to Good, which means "Very heavily worn with portions of lettering, date and legends worn smooth. The date may be barely readable." Such a coin, for example, even if it is a three-legged buffalo nickel (because of a strik-

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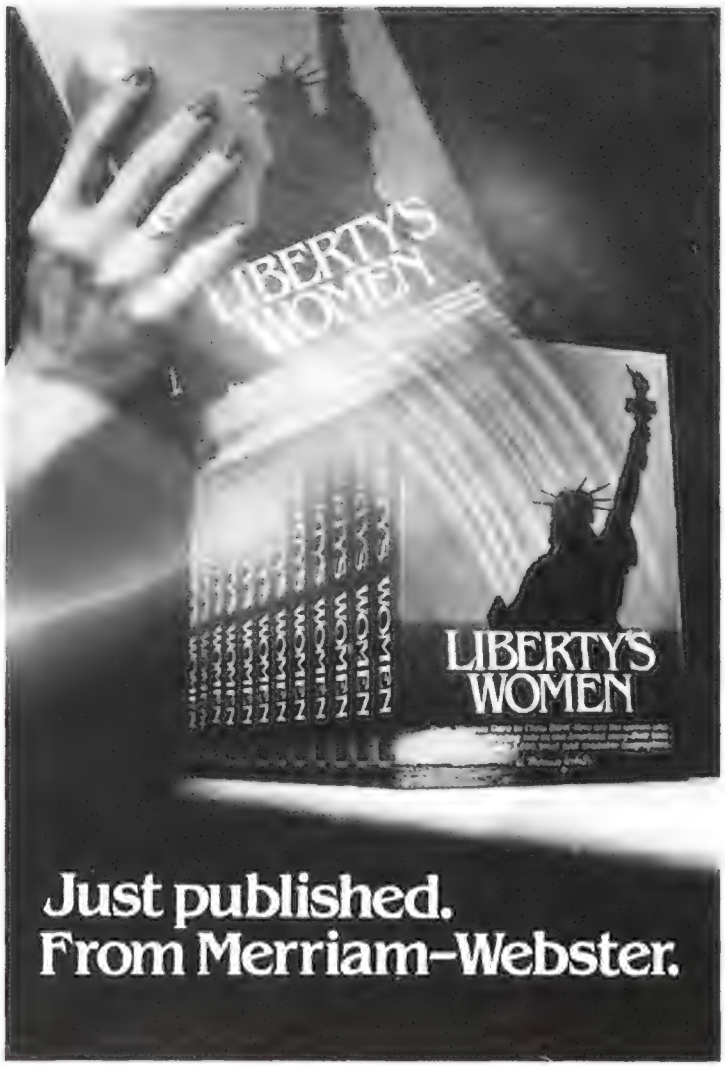

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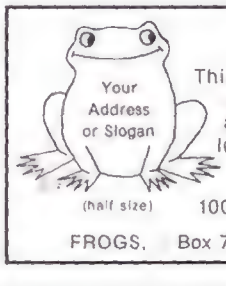

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Elephant token may have been struck to stir interest in the Carolina Plantation.

ing error the buffalo wound up with only three legs), is worth less than $20 in the lowest grade, although an Uncirculated coin might fetch $1,000. The term "Pattern" designates a design proposed—but not necessarily accepted—for minting.

And there are other factors. Where was the coin minted? And in what year? A 1909-S V.D.B. penny in good condition is particularly valuable because San Francisco produced only a comparatively small quantity before the initials V.D.B., signifying that Victor D. Brenner had designed the coin, were removed. They were not restored for nine years.

Recently David Bowers told me that prices of rare coins have been rising steadily, year by year, averaging around a 15 percent increase annually. (In the past few years, they have zoomed up much faster.) He also said that the probability that they will continue to rise seems high. "We have a situation in which a static supply of coins—there will never be very many more available than there are now—is beset by an increasing demand as more and more collectors crowd into the field. This makes for rising prices. It is precisely why a Proof-like Uncirculated 1796 quarter which was offered to me 24 years ago for $200, and which I turned down for reasons of my own, is today worth $30,000."

Except when he is talking business, Bowers is inclined to be a taciturn man. Yet beneath his cool exterior there is a burning passion for old coins and everything they represent. "Just think of a coin that Abraham Lincoln might have

A later issue of the coin corrected the misspelling of the word proprietors.

jingled in his pocket!" he will say. "Or a Nova Constellatio silver Pattern, the first true U.S. coin, struck by order of Robert Morris, financier of the Confederation. His assistant, Gouverneur Morris, advanced the first proposals for an American currency. He based it on a 1,000-unit piece he called a 'mark.' Half a mark was a 'quint.' A fifth of a quint was a 'bit.' If only coins could talk, think what they could tell us!"

It's an aspect of numismatics that can and does captivate many collectors. "God Preserve New England" says an Extremely Rare 1694 token with an elephant on the other side. One contemplates it and wonders: Why an elephant? Made of copper and worth a half-penny in its time, it has its counterpoint in a similar coin from Carolina which invokes the Deity to "Preserve Carolina and The Lords Proprieters."

The whole history of the United States is spanned by coins bearing the likeness of Liberty. She appeared on the first issues of the U.S. Mint, after long debates about whether or not George Washington should be depicted. This idea was finally turned down because of recent memories of coins embellished with the likeness of the King of England. Liberty was considered more fitting, and Martha Washington may have been the model.

Through the years Liberty has appeared in many guises. She is seen with flowing, curly hair in the 1792 silver-center cent, with a plug of silver at the base of her copper neck to give the coin its intrinsic value. Robert Birch, one of the

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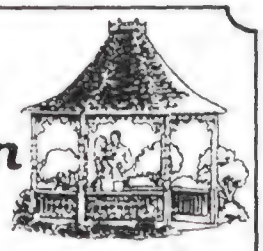

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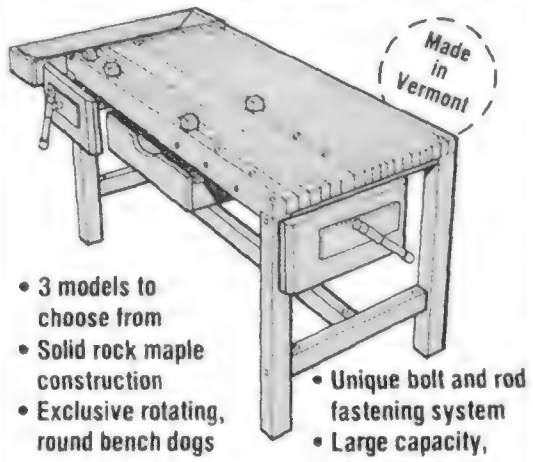

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Changing face of Liberty has silver plug in 1792 copper (upper left), dons cap (upper right) in $10 gold coin and carries cap on a pole (lower left) in 1795 cent.

first engravers for the Mint, shows her in a 1792 Pattern quarter dollar, of which only three are known.

George Washington himself supplied the silver with which the Mint got started in July 1792, and most of it was used to strike "half-dismes"—dime being spelled with an "s" in those days. Copper, oddly enough, was the hardest metal to obtain, and the Mint went into business with only six pounds of it on hand. Maryland kicked in $80,000 worth of French silver coins from pre-Revolutionary days, in 1794. In 1795 the Mint received its first shipment of gold bullion from a Boston merchant. Some of it was used to strike 744 half eagles. Liberty appears throughout, now with a cap, now with flowing hair, now with a bun, now stern, occasionally almost half-smiling. In every case

By 1877, as indicated in gilded $50 pattern piece (lower right), she still needs to lose weight but has had her hair fixed and crowned by a tiara.

she seems a lusty, busty woman, a fit symbol for a youthful nation bursting with revolutionary energy.

Nowhere could all this be seen so completely as in the Garrett Collection, which includes everything from Colonial coins right up to the modern coins which no longer bear any precious metal, but are only outward symbols of what they are supposed inwardly to be. "By way of illustration," said Robert Korver, the numismatist in charge of auctions at Bowers & Ruddy, "consider those quarters that you have been collecting." (I have a modest assemblage of so-called Standing Liberty quarters struck from 1916 to 1930 which I collected in the Thirties and Forties because the flying eagle on them reminded me of a sea gull.) "Those quarters had an intrinsic value of

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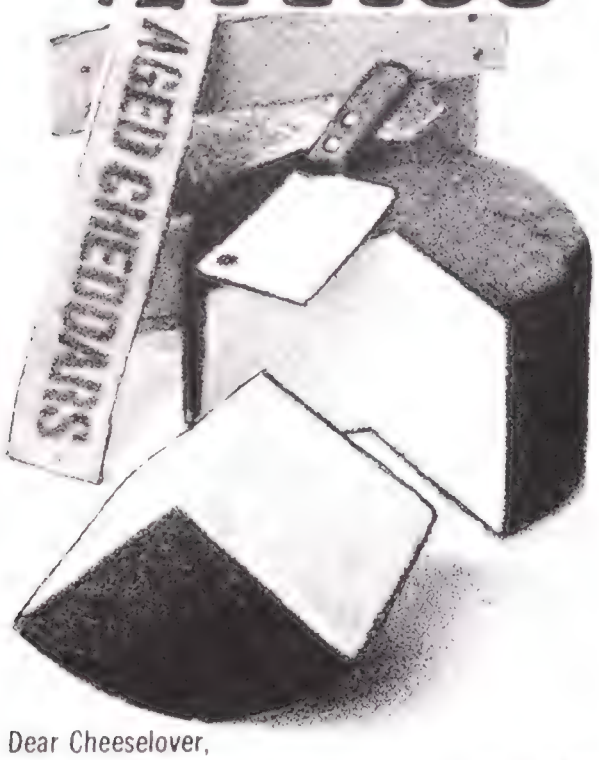

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25 cents because there was at least that much silver in them—they were rightly called *silver* quarters. One of them, in 1950, would have bought you about one gallon of gasoline. On the other hand, it takes more than *four* 1980 quarters to buy one gallon of gas today. There's no silver in those coins at all. They are 'clad' in a mixture of copper and nickel over a copper core. Your coins, on the other hand, are worth about $1.75 on the numismatic market now.

"Someday the Susan B. Anthony dollar will be an object lesson, I hope, showing what happens when the government stops putting intrinsic value into coins. The Mint could not possibly have chosen a more appropriate time to issue this symbol of what has happened to the dollar. The value of the dollar worldwide has declined steadily, and confidence in the American government is at perhaps an all-time low. So here comes the Susan B. Anthony dollar. It is one-quarter the size of the Eisenhower silver dollar. The public is declining to use it because it is so easily confused with a quarter. It has no silver in it—its intrinsic value is nil."

Therein lies one of the great, almost indefinable attractions of coin collecting—the feeling that in these bits of gold, silver and copper you can grasp a fragment of a more stable past, one with established values which were meant to last, and find comfort in them against the uncertainties of an unstable and unpredictable future. Just to look at Saint-Gaudens' MCMVII figure of Liberty, sculpted in solid, heftable gold, striding forward right off the coin and into a world she seems determined to conquer—that alone is enough to start any day on a note of hope and confidence. Her value is eternal.

George Bennett, veteran coin auctioneer, presides at the sale in November 1979.

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Spring, in this eighteenth-century town, is always an experience to delight the senses.

It's the scent of blossoms reborn in a hundred colonial gardens, of wood chips at the cooper's shop and fresh gingerbread at the baker's.

It's the clip-clop sound of horse and carriage; the music of recorder and harpsichord, fife and drum; the bleat of sheep grazing on the green, the rattle of keys at the ancient gaol.

It's the sight of elegant furnishings in elegant rooms, craftsmen busy at their benches, an evening debate at the Capitol, an actor drawing laughter in an eighteenth-century farce, a colonial governor at home in the Palace.

It's the taste of Welsh rabbit, Brunswick stew, Virginia ham, and oyster pie in one of three colonial taverns; and of quail, and tournedos Rossini at the five-star Williamsburg Inn.

This spring, sample the scents, sounds, sights, and tastes of Colonial Williamsburg. Come by air, Amtrak, bus or car and view spring from another century. It's an experience your senses won't let you forget.

For reservations or information on accommodations and package plans at Williamsburg Inn, Williamsburg Lodge and The Motor House, see your travel agent. Or dial 1-800-446-8956 toll-free. (1-800-582-8976 in Virginia.)

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The World Wildlife Fund announces
a most important new porcelain collection

hummingbirds of the world

by Robin Hill

The shimmering, iridescent beauty of hummingbirds—
captured in an enchanting collection of twelve cups and saucers
by one of the world's most distinguished bird artists...
his first works of art in porcelain.

Each cup and saucer will bear
a new work of art created by Robin Hill
exclusively for this limited edition.
And each will be decorated
with pure 24 karat gold.

The Artist. Robin Hill is recognized as one of the world's finest bird portraitists. His paintings of birds have been exhibited in leading art galleries throughout the world—including a spectacular show at the famed Corcoran Gallery of Art in Washington, D.C. He is represented in many important public and private collections, including the Dublin Museum of Art and the collection of HRH Prince Philip, Duke of Edinburgh. And plans are being made for a museum to house his work exclusively—an honor accorded to few artists throughout history.

Hummingbirds—"winged jewels" they have been called—demanded a very special medium, because of their brilliant gem-like coloration and tiny size. And so Robin Hill created a unique and extraordinary series of works of art for *cups and saucers* of fine porcelain, in a tradition that dates back more than two centuries.

Thus, at the height of his career, Robin Hill has now created *his first works of art in fine porcelain.* An extraordinary series of twelve collector's cups and saucers of fine porcelain, portraying the glossy brilliance and shimmering grace of hummingbirds—in authentic detail—with all his incomparable artistry.

Each of these twelve collector's cups and saucers is a separate, unique, and wonderful work of art created exclusively for this limited edition. Together, they form an extraordinary collection that will be a treasured acquisition for everyone who loves the beauty of birds, of art and of fine porcelain.

The Hummingbird cups and saucers. The collection is an official issue of the World Wildlife Fund, the world's largest privately supported nature conservation organization. It is the World Wildlife Fund's *first* international issue in porcelain.

The cups and saucers will be crafted in fine Bavarian porcelain, whose exceptional whiteness is ideally suited to bring out the dazzling beauty of the hummingbirds. And each hummingbird will be associated, in Hill's superb works of art, with its favored flower. The vivid leaves and bright blossoms provide a perfect setting for the

ıummingbirds shown on the front and back of each cup.

Here is how the great naturalist painter ohn James Audubon described this beautiful, tiny bird:

"A glittering fragment of the rainbow... noving through the air...as if by magic... yielding new delights wherever seen."

Robin Hill's meticulously accurate works of rt—at once brilliant and subtle, striking nd completely natural—capture these iracles of nature in all their beauty, in as ıany as 16 separate ceramic colors. And ach cup and saucer is bordered by bands f pure 24 karat gold, hand-applied to omplete the design. The result is a collector's joy...true limited edition works of art in orcelain that will form a focal point of eauty wherever you display them.

he limits of edition. The World Wildlife Collection of Hummingbirds of the World Cups nd Saucers will be produced only once, nd in strictly limited edition, with an absote closing date of March 31, 1980.

The cups and saucers will be crafted olely for subscribers. Individual cups and aucers will not be sold separately. And ere is a further limit of one subscription er collector.

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ubscription deadline: March 31, 1980. ıe collection will be issued on a convenıt subscription plan, at the rate of one ıp and saucer every other month. The iginal issue price of just $39 per cup and ıucer is payable in two equal monthly inallments of $19.50 each. And each cup ıd saucer will be accompanied by a spea stand, so that you can display them in ur own home just as they are shown on ese pages—the saucer on its edge and e cup in front of it, forming a charming ıd complete composition.

In addition, each cup and saucer will be companied by a commentary written escially for this collection, describing the ummingbird portrayed, its native habitat, s favored flowers and much other fascinating lore. A Certificate of Authenticity, attesting to the limits of edition, will accompany each collection.

There is no need to send any payment with your application. But your Subscription Application must be postmarked by March 31st, at the latest, to be accepted.

Shown smaller than actual size
The saucer measures 139mm in diameter, the cup measures 63mm in height

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The World Wildlife Fund was formed to help preserve life in the natural world, and to help safeguard the world's natural environment from irreversible damage. Its scope is the whole of nature.

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The World Wildlife Fund has appointed Franklin Porcelain to service and fulfill all subscriptions to the Hummingbirds of the World collection.

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hummingbirds of the world

An official issue of the World Wildlife Fund

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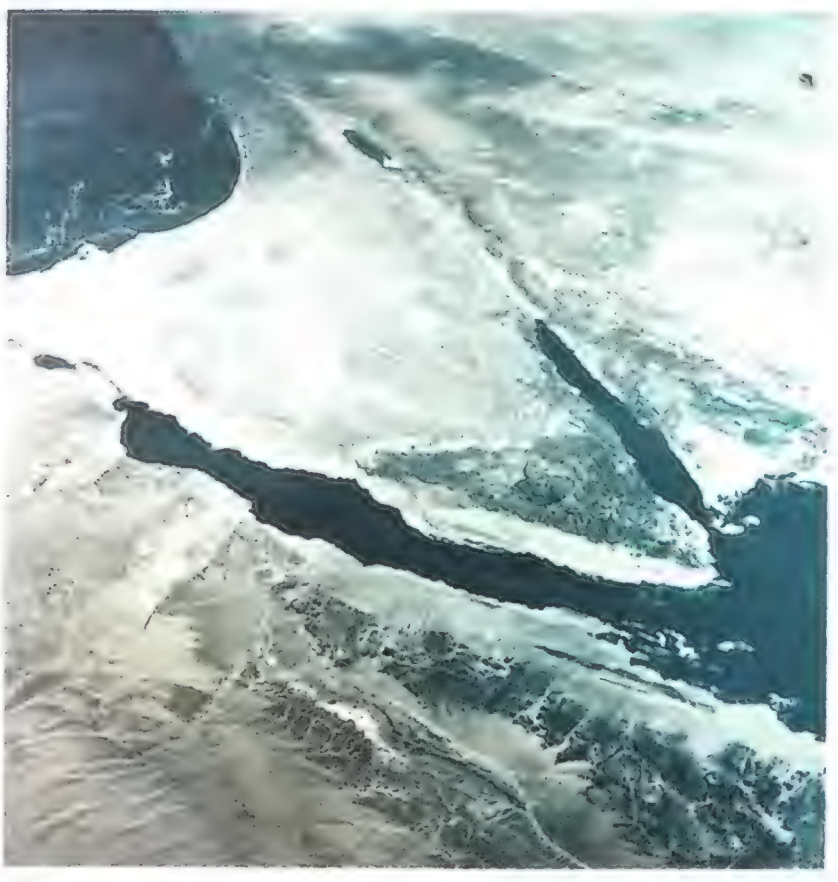
Book reviews

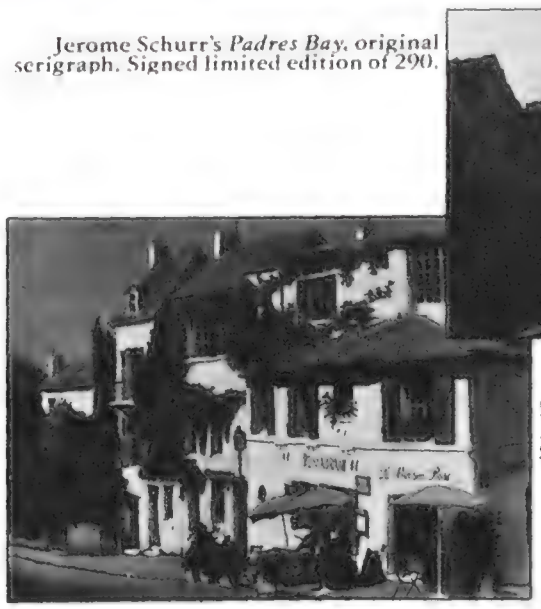
Sinai: The Great and Terrible Wilderness
Burton Bernstein
(Viking Press, $13.95)

Arabia:
A Journey Through the Labyrinth
Jonathan Raban
(Simon and Schuster, $11.95)

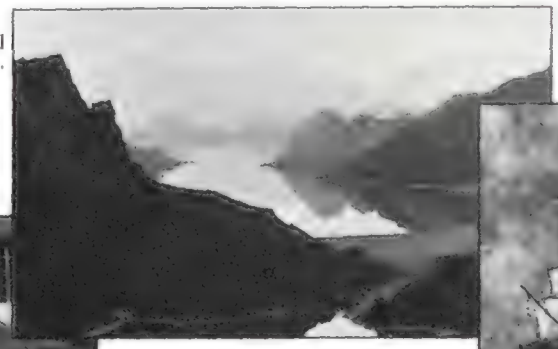
"They were a people of spasms, of upheavals," T. E. Lawrence said of the Arabs. The spasms and upheavals of the new Middle East have prompted countless published words on the gushing wealth of the oil sheikhs and on disengagement in the Sinai, but few of those words have enlightened us much about life in the Sinai or the sheikhdoms. Here, happily, are a couple of books that do, and they do it with wit and insight.



The Sinai peninsula as seen by satellite.



Jerome Schurr's *Padres Bay*, original serigraph. Signed limited edition of 290.



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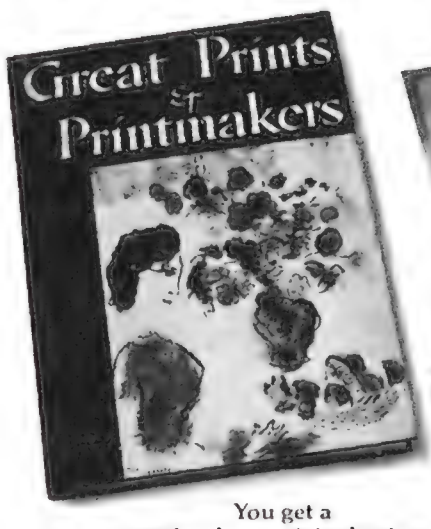

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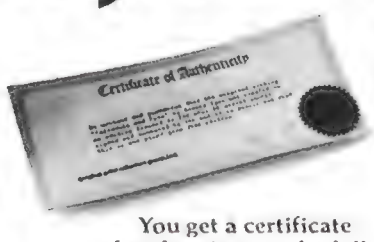

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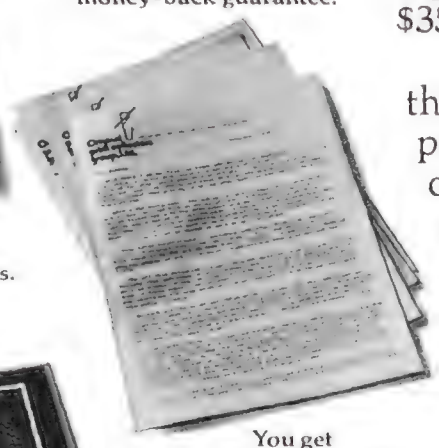

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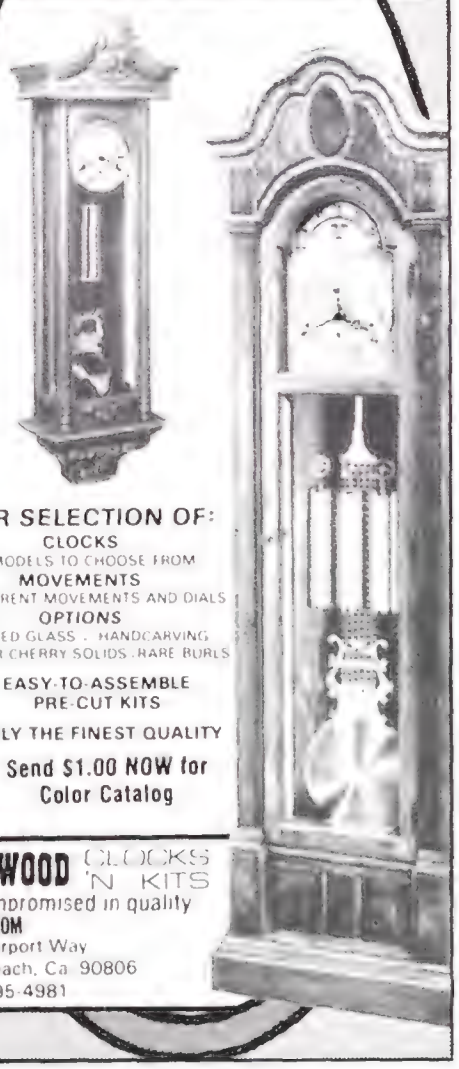

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Neither Burton Bernstein nor Jonathan Raban is a traveler in the tradition of Lawrence or the epic explorers; neither would claim to be. They are visitors. Bernstein's book is based on four hurried journeys through the Sinai, mostly by four-wheel-drive Land Rover and U.N. Volkswagens; Raban spent 14 weeks on the edges of Arabia—he failed to get into the Saudi heartland—traveling by jetliner. Yet both men chronicle aspects of the upheavals not found in the books of Lawrence or Wilfred Thesiger (or of Henry Kissinger, for that matter).

Bernstein, a staff writer for *The New Yorker,* is entranced with the Bedouins who people what he calls the "seemingly worthless, underpopulated, undercultivated, static piece of gritty real estate" that is the Sinai. Despite Israel's occupation of the land in 1967, despite Egypt's insistence that it be returned, despite the Camp David manipulations to reconcile the two, Bernstein says it is really the Bedouins, "overlooked in all the squabbling," who own the Sinai.

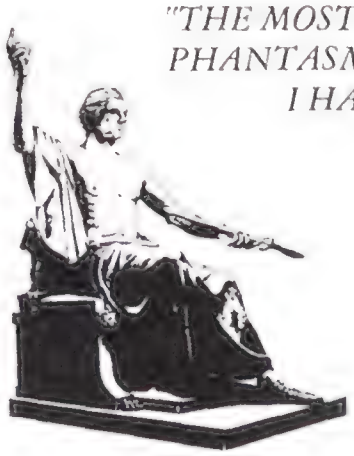
He sets out to visit them, in sometimes bizarre fashion. He breakfasts in El Arish with a Bedouin banjo player, a camel racer and a Kent-smoking sheikh who has just received a letter from a Dutch hippie. He treks behind a 13-year-old Bedouin girl up a mountain to the turquoise mines of Serabit el Khadim. He inspects the ancient fortress-monastery of St. Catherine. He theorizes on how Moses struck water from a Sinai rock. He wonders at the Holiday Inn atmosphere of the U.S. Sinai Field Mission camp.

He writes vividly of it all and he concludes, sadly, that although the Sinai may outwit its modern intruders, the Bedouins might not survive the modernization of the great and terrible wilderness.

Jonathan Raban has no such romantic sentiments about deserts. A British free-lance writer and playwright, he is a self-confessed urban rat and his *Arabia* is the new, urban Arabia built by petrodollars, full of skyscrapers and green with grass imported from Mexico.

So wary is he of health hazards that he considers a suggestion from his London doctor to wear rubber boots for the entire trip around the emirates of *El Khalij,* the Persian Gulf. When he visits Bedouins he goes in a chauffeured car provided by Abu Dhabi's Ministry of Information. (And his Bedouins have sodium streetlights, air conditioning and television.)

"THE MOST HORRID PHANTASMAGORIA I HAVE EVER BEHELD!"



Thus did one United States Senator describe Horatio Greenough's statue of George Washington when it was unveiled in 1840. The sculpture then was left to weather the elements on the Capitol grounds for 65 years until Congress bestowed it on the Smithsonian "to aid the Institution to establish a National Gallery of Art in Washington." The "National Gallery" begun by this gift later became the National Collection of Fine Arts. But the Greenough statue put the Smithsonian permanently into the business of acquiring and displaying works of art. Greenough's work now occupies a place of honor in the Museum of History and Technology, having survived the art critics of that earlier era.

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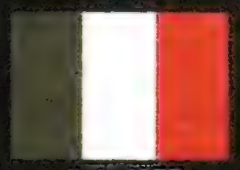

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He finds the desert "simply boring . . . stretching away like a flat Sunday afternoon." Yet Raban himself is anything but boring. His account of the Gulf sheikhdoms, uncomfortably adjusting to prosperity and modern intrusions, and of North Yemen, Cairo and Amman, is very informative and very funny.

He is intrigued, too, by the carpetbaggers—the Western businessmen huddled in the hotels, making deals; a traveling salesman cornering the depilatory cream market in North Yemen; the Arab expatriate technocrats (the Palestinians, Lebanese, Egyptians, Jordanians) getting ulcers as they manage the sheikhs' development programs.

It is an Arabia of almost immeasurable spasms and upheavals, and this is a fine "inventory of the chaos."

—David Lancashire
The Globe and Mail, Toronto

Backwaters
Stephen Jones, illustrations by Richard Brown (W. W. Norton, $12.95)

This engaging collection of reminiscences offers some hope that the art of the familiar essay is not dead.

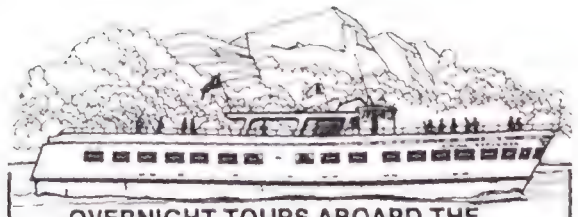
Jones, a New Englander and onetime lighthouse keeper and lobsterman, now a teacher of literature at the University of Connecticut, has brought together a host of memories from half a lifetime spent along the Connecticut coast and its rivers. The common denominators are place and element, the first being Noank, Connecticut, and the second, water.

The memories of Jones' easygoing carpenter father and the doings of the waterfront "layabouts" of Noank and nearby Mystic, as well as the fabric of life at the mouth of the Mystic River in the Forties and Fifties, are what provide the warp and woof of this good-humored book.

Backwaters begins with Jones' earliest perceptions of the infinite possibilities of water when he first becomes aware of what his father assures him is "an underground river" coursing beneath a grate in the family cellar.

In his imagination, Jones would "slip away on the underground river," and from there it was only a step or two more into growing up for his discovery of the little river out back, and then the mighty Connecticut itself and its promises when he was able to navigate the town on his own.

"Water is the metaphor because that



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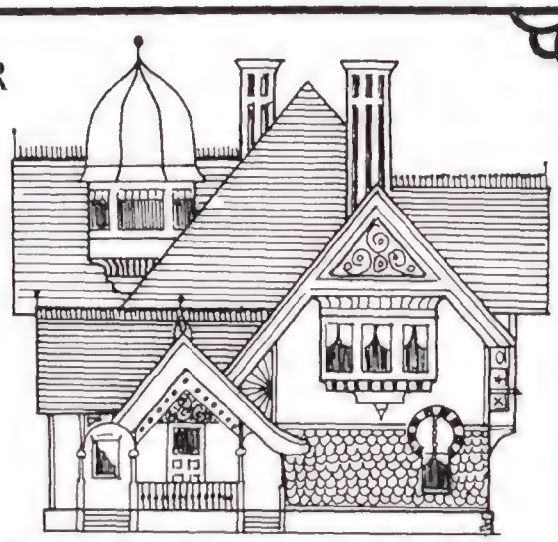

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is where I live," says Jones, and his increasing preoccupation with the wonder and mystery of it creates the ambient world for the adventures of *Backwaters:* bluefishing trips, rough-water sailing, resurrecting sunken but still dignified hulks, trying out pulling boats.

Along the way Jones considers such diverse matters as the present status of monks, the terrible beauty of the praying mantis and "the supreme madness of the yard-sale season," in a technique which can only be described as the associative process run riot.

Like Laurence Sterne's improbables, Jones' characters and their yarns won't be rushed, and a reader of *Backwaters* would do well to take the book in unhurried stride to savor the pace. What Jones really has to say here—a way of saying Yes to life—is revealed through the sum of all his essays, and although the book does not cry out for reading at a single sitting, looking at it piecemeal won't reveal his story by half—or by any other fraction.

Jones shows that he learned early what most of us find out in only old age: how to forgo the dreams of oversize adventures we might yearn for but few of us experience, and to rejoice instead in the joy and fulfillment of the close-at-hand pleasures of ordinary life.

—Edward Brown
Writer on country life and ecology

Stones of Silence: Journeys in the Himalaya
George B. Schaller
(Viking Press, $15)

"One noon, not long after arriving at Kanha, a woodcutter came to our bungalow and told me that a tiger had killed a cow. He led me through the forest and along a streambed in which water remained only in shady pools until we reached the kill site. The cow was gone, a trail of rumpled leaves showing where the tiger had dragged the carcass up a ridge and into a clump of bamboo. . . . I waited through the hot stillness. . . . Finally, shortly after five o'clock, a tigress appeared and boldly strode to water. I remained motionless, wholly absorbed by this vision of her flaming, black-striped coat and barely contained power; her beauty was so great that my mind glowed while contemplating such evolutionary perfection. . . . She crouched by a pool a

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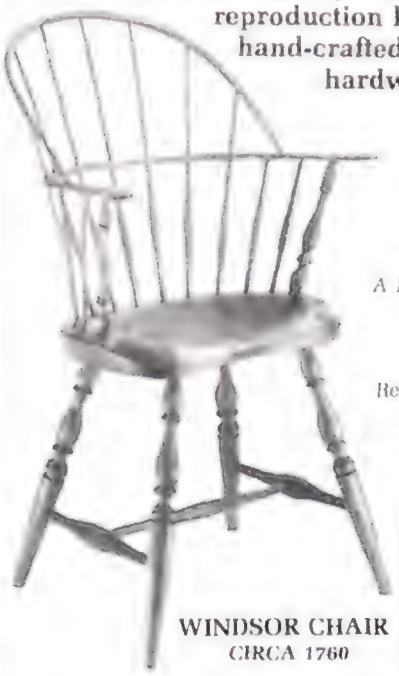

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hundred feet from me and lapped water, treating me with studied indifference. Once she fixed me with amber eyes and as a gentle warning bared her teeth. Then calmly she ambled back up the slope to her kill, and I hurried home through the dusk elated beyond measure."

Readers have come to expect such delight from field biology, especially when the author of *The Mountain Gorilla* and *The Serengeti Lion,* George B. Schaller, is our guide. Although the encounter with the Bengal tiger appears in this latest book, Schaller's interests this time are largely centered on more prosaic fauna. This book is the record of parts of six years afoot in the Himalayan uplands. It sings of the wild goat, ibex and markhor, the Himalayan and Nilgiri tahr, the urial and the bharal (or blue) sheep.

Schaller's special interest, a thread that is woven throughout this book, is the behavioral difference between sheep, which have adapted to open slopes, and goats, which are suited to cliffs.

Habitat also results in specialized mating behavior. Because sheep live in scattered herds, rams range widely in search of ewes; male goats, living in more cohesive groups, tend to stay with their mates.

The Himalayan region was created tens of millions of years ago. When the Indian subcontinent began to drift north and attach itself to central Asia, the resulting crush transformed what was once the bottom of the Tethys Sea into the highest mountain range on Earth. The evolution of this new habitat not only gave us the differences between sheep and goats that we now see, it also resulted in the rocks, ice and desolate vistas that are conducive to subtle reflection and spiritual resignation. It is no accident that great Buddhist monasteries are there.

Marco Polo journeyed through these passes on his way to China in 1273. What is surprising is that he was not the first traveler to do so. In fact, this rugged terrain had been part of the silk route since about 120 B.C. For most of 2,000 years, the route was open, until politics and the Chinese closed it in 1949.

The age and grandeur of all this easily conspire to bring a catch to the throat of anyone. This land is "raw creation" at its best—a state of continuing evolution that we are fortunate to be able to witness in the pages of Schaller's fine journal.

—*Michael Olmert*
Annapolis writer and critic

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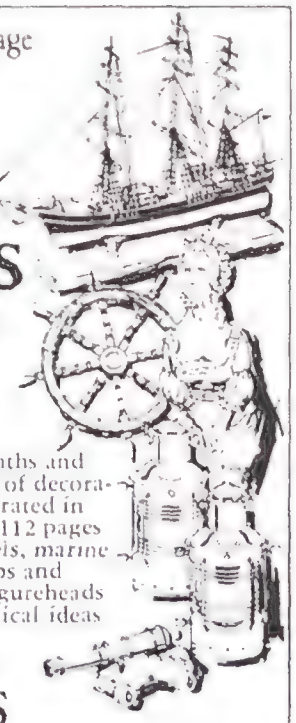

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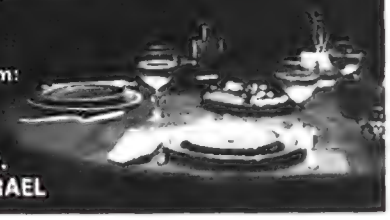

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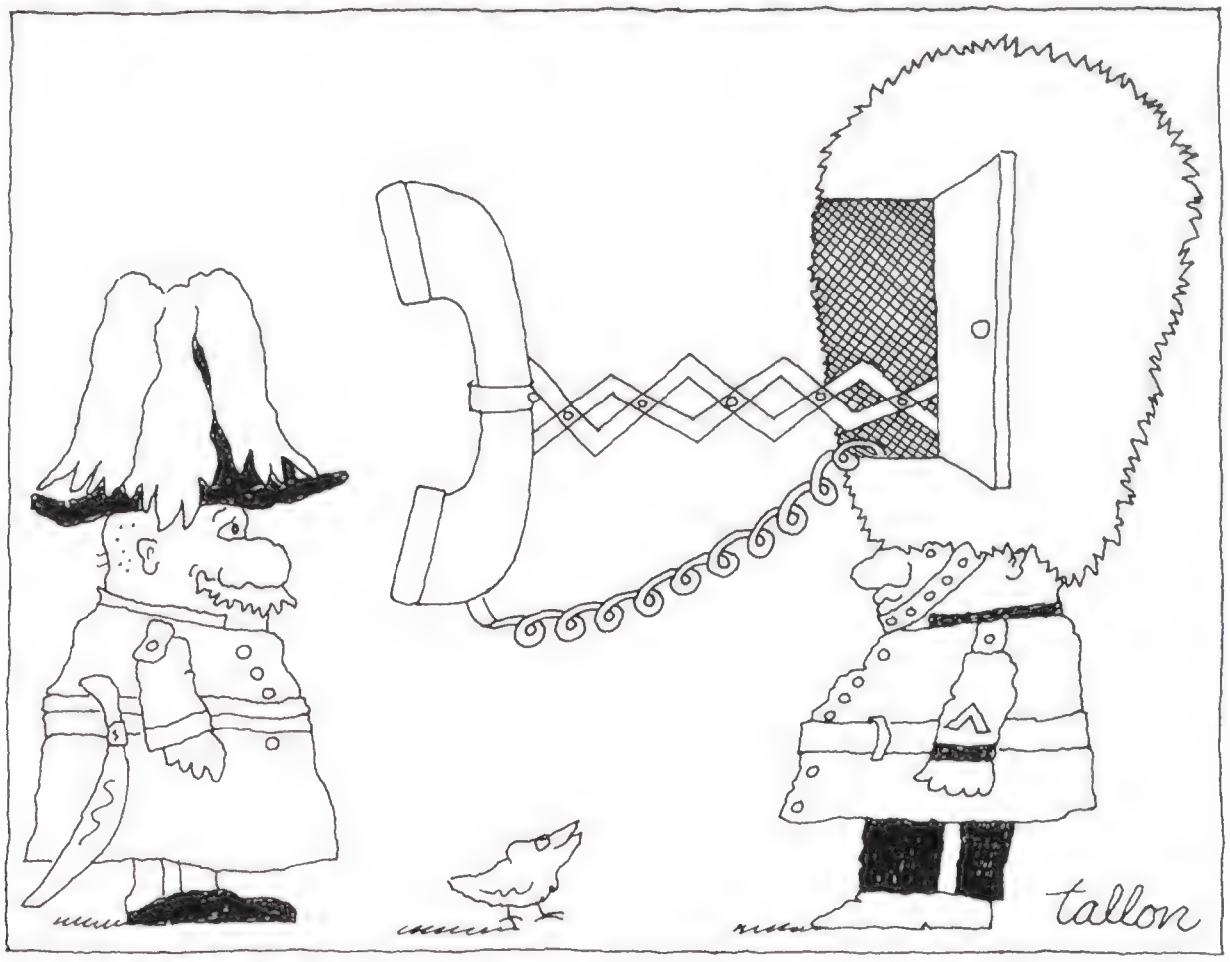

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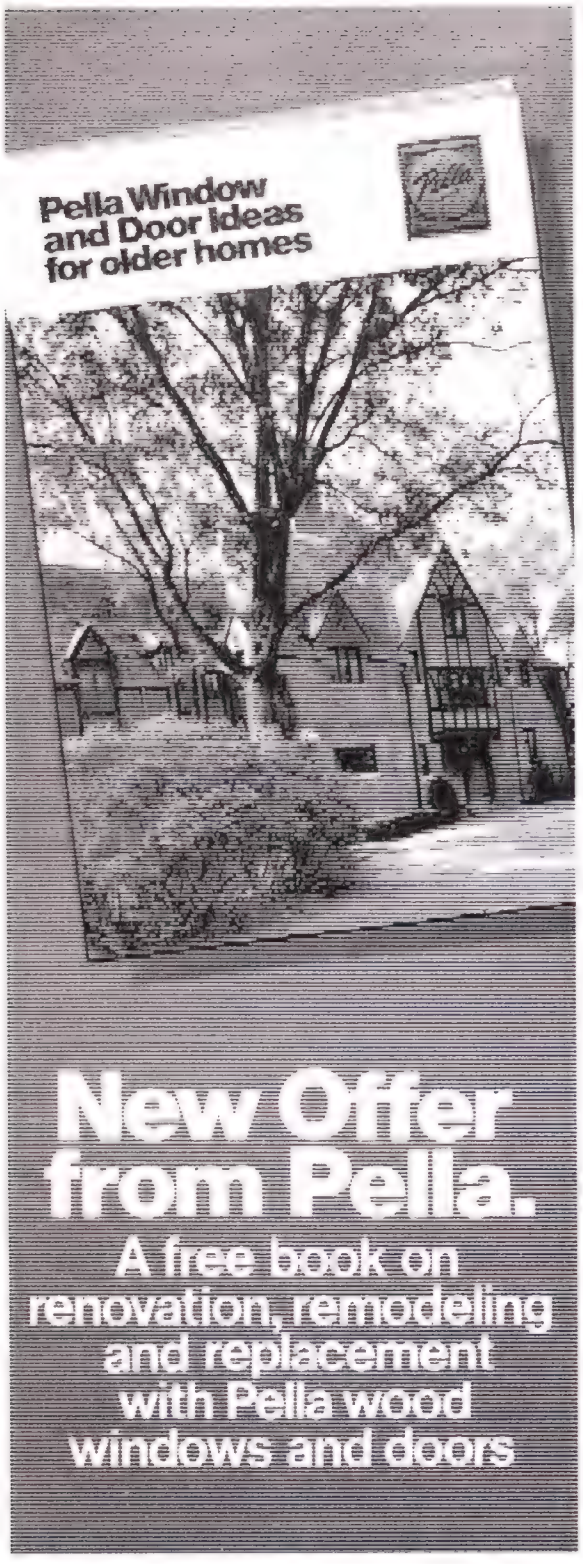

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American Diner
Richard J. S. Gutman and Elliott Kaufman in collaboration with David Slovic
(Harper & Row, $20)

One of the great boons of our so-called post-modern era is the way it has opened our eyes and hearts to many things around us. *American Diner,* a book and a photographic treat by Richard J. S. Gutman and Elliott Kaufman, is an outstanding appreciation of that most familiar of American eating places as a vernacular art form.

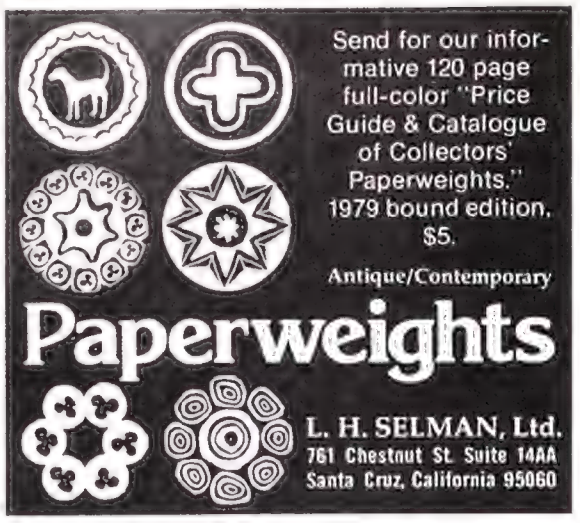
The book is part scholarship and part history-as-anecdote. It contains some spectacular color pictures and three "portfolios" of black-and-white photographs by Kaufman. Diners often look like strange, mongrel constructions dropped on us from outer space. This book shows them as a homegrown, terrestrial development and examples of considerable engineering, production and design ingenuity.

The first horse-drawn lunch cart, Walter Scott's Pioneer Lunch in Providence, Rhode Island, began selling sandwiches and coffee to late-night workers back in 1872, a kind of refinement on the Yankee peddler theme. The first walk-in wagon appeared in 1884. The vehicles became so successful that entrepreneurs started taking out patents on them.

Success eventually produced a full-fledged industry, with factories and assembly lines, advertising and rivalries—and a fair amount of spying between companies. Legends were born, fortunes were made and lost. T. H. Buckley met his doom by overspending on his famous White House Café, which boasted an $8,000 soda fountain made of Mexican onyx and sporting 36 syrup dispensers.

Owners went to imaginative lengths to embellish their diners; stained-glass windows were a popular item (some incorporated menus in the designs), as were hunting scenes, landscapes, and works of political and historical interest painted on the outside. By the mid-1920s, diners were trying to attract the ladies, which was the main reason that tables and booths were added. The issue of female clientele was hotly debated.

By the 1920s, too, all sorts of gimmicks started to make their appearance. Hence diners in the form of pigs, coffeepots, brown derbies and wigwams that still make many car trips amusing; diners seem to thrive on the fantastic and eccen-



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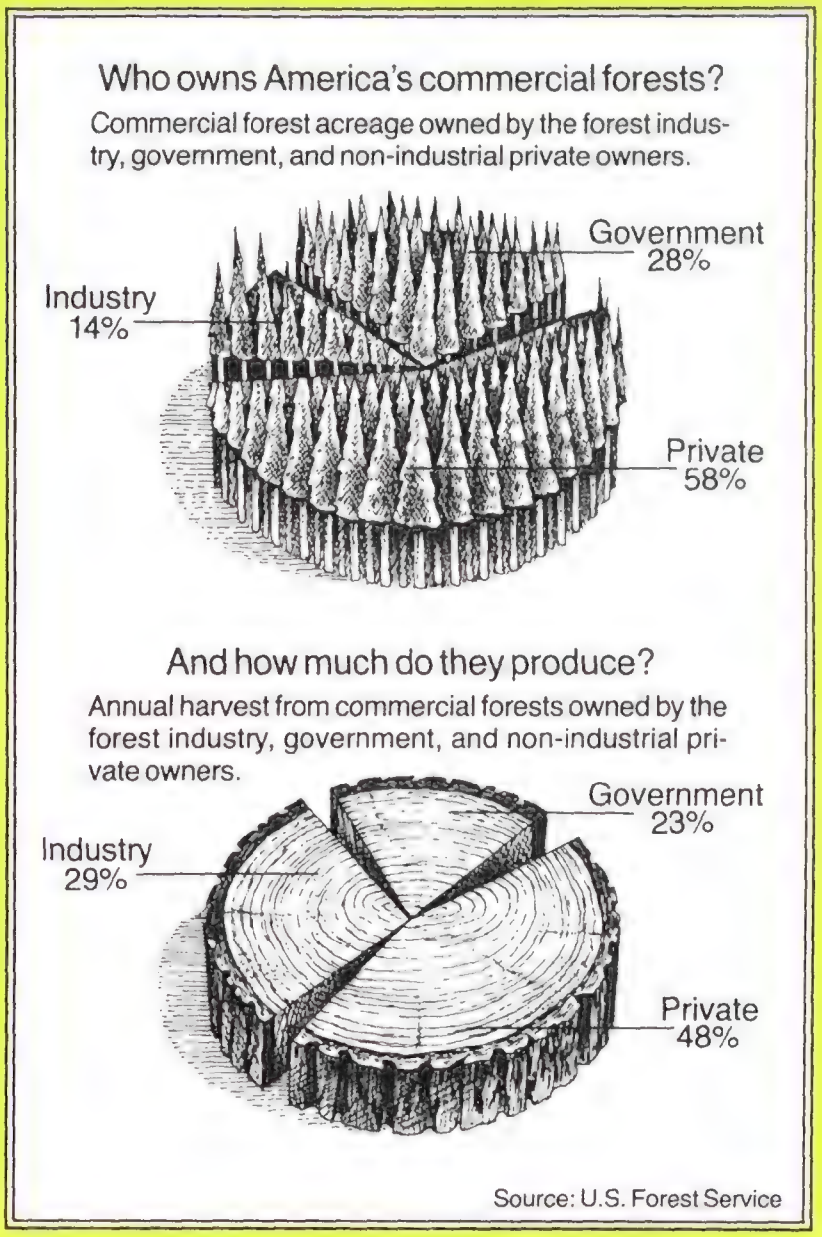
A report on the great American forest.

Good forest management means growing more trees. Not sharing shortages.


Who owns America's commercial forests?
Commercial forest acreage owned by the forest industry, government, and non-industrial private owners.
Government 28%
Industry 14%
Private 58%
And how much do they produce?
Annual harvest from commercial forests owned by the forest industry, government, and non-industrial private owners.
Government 23%
Industry 29%
Private 48%
Source: U.S. Forest Service

It's no accident that the most productive forests in America are those owned and managed by the forest industry.

Although they make up only 14% of the commercial forestland, they provide 29% of the annual timber harvest.

This is because the industry has learned that it's not only possible to grow more trees faster, but also imperative.

It's a race against time: Every year Americans need more lumber and plywood to build homes. More furniture to make them liveable. More paper and pulp to print the books and periodicals that educate, enlighten and entertain. More packaging and containers for thousands of essentials, from milk to machinery.

The sobering fact is that within 50 years U.S. demand for wood and paper products is expected to double.

Yet not all the nation's commercial forests are working equally hard to get ready.

What is a commercial forest?

Commercial forest, as defined by the U.S. Forest Service, is *all* forestland — whether owned by individuals, government or the forest industry — that is capable of, and potentially available for, growing repeated crops of trees for harvest. It includes land in National Forests but not in National Parks or Wilderness areas.

On all commercial forestland, tree growth per acre averages only 61% of potential, which is not good enough. The greatest room for improvement, however, is in National Forests, where trees now grow at only 48% of potential.

Yet as the industry has shown, the growth cycle can be speeded by applying such techniques as: encouraging natural regrowth, planting superior seeds and seedlings, fertilizing, thinning and protecting trees from disease, insects and fire.

How soon can we start growing more trees?

Since we clearly have the know-how to grow more and higher-quality trees, how soon can this nation get on with the job of increasing productivity on *all* commercial forestlands?

The first step is to understand the problem. If you'd like to learn more about the importance of America's forests and the challenges they face, send for a free booklet, "The Great American Forest." Write American Forest Institute, P.O. Box 873, Springfield, VA 22150.

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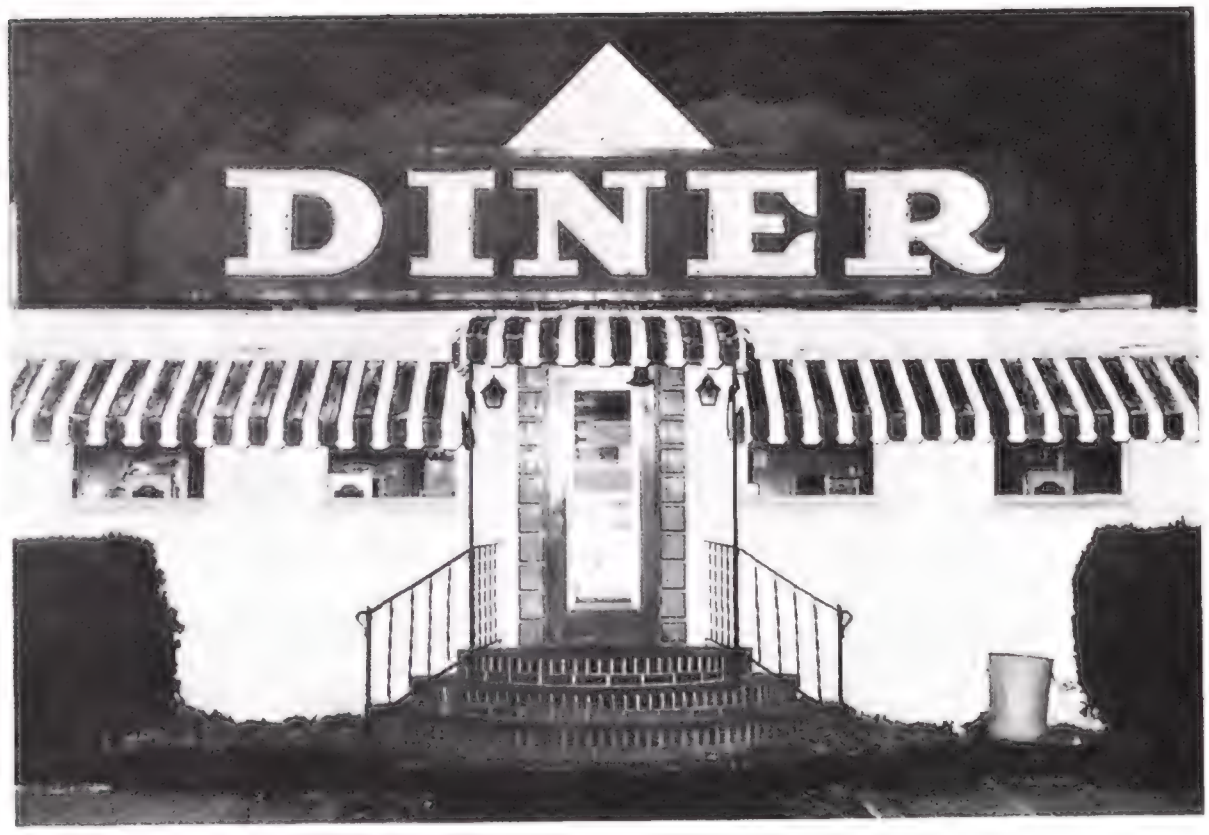
tric. With the advent of Twenties modernism, a more industrialized look and synthetic materials took diners by storm. This was even more true of the "streamlined" 1930s, with sloping graphics, rounded corners, swivel stools and sleek Formica and chrome.

American Diner is a lesson in history and art history, not just a string of yarns from old-timers. In fact, at least one diner is now in the National Register of Historic Places, thus saved from the "rage for renovation."

Elliott Kaufman's black-and-white photographs and the many period photographs lend a documentary aura, but also a sense of nostalgia. Diners themselves evoke a particularly American nostalgia; however, there is nothing natural about them. They are the prefabricated inventions of an industrialized, mechanized society. But they are not hostile to humanity. Although the wrinkles and sags and dumpiness of the human body stand out next to the hard shapes and geometric patterns Kaufman photographs so beautifully, diners come across as friendly places. People smile warmly at us and at each other, and when they are alone they seem less lonely than self-sufficient.



The quintessential American diner.

All of this is reflected in a book in which the chapters and layout form little vignettes; as small, compact and inviting as diner interiors themselves. Diners are awfully trendy these days, what with *Alice* on TV and truckers as our latest folk heroes. *American Diner* offers a refreshingly serious review of these roadside attractions.

—Celia Betsky
Free-lance writer and critic
for National Public Radio

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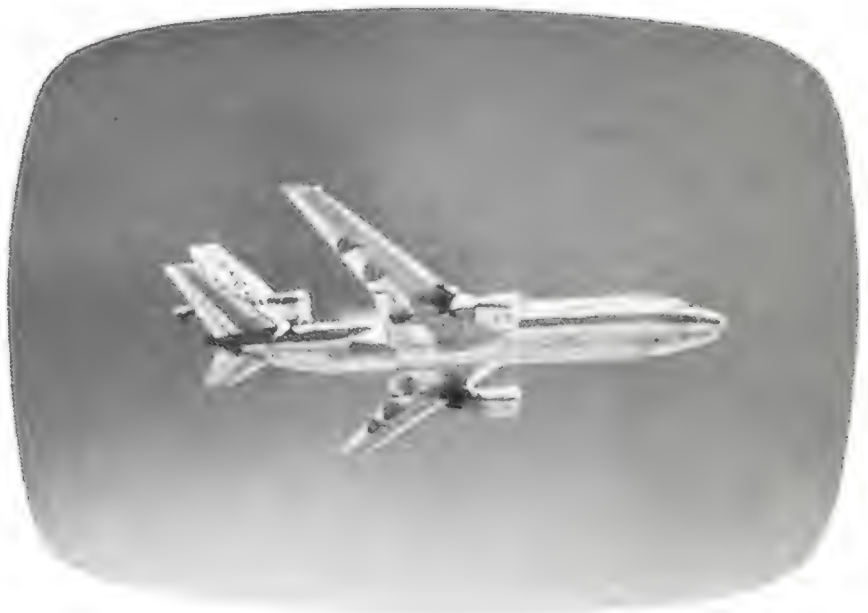

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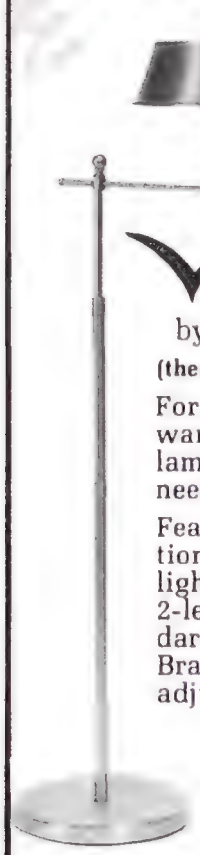

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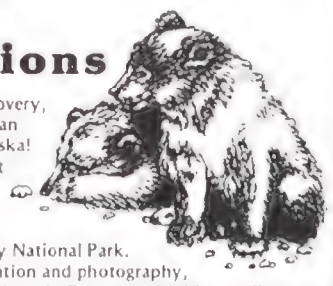

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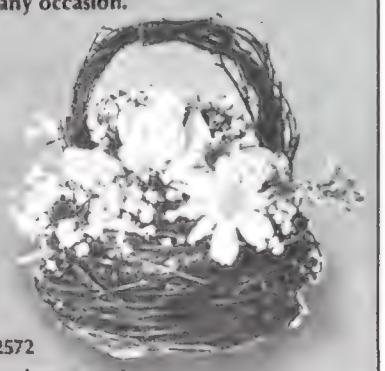

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Take a respite in the middle of a long day lingering over luncheon with friends.

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Breakfast (Constitution Avenue entrance before the museum opens) 9:00-11:00 (weekends only) $3.75 (children $2.50)

Luncheon and Weekend Brunch 11:00-4:00 $4.75 (children $3.50)

Dinner 4:30-7:30 $4.75 (children $3.50)

Commercial parking is available at the National Air and Space Museum on 7th Street—but early weekend mornings and every evening you can usually find a space right on the Mall. To assist in planning your Smithsonian visit, orientation services are provided at the Associates' Reception Center in the Castle from 10-4 daily.

We look forward to seeing you!

The Associates Court

Foundation (Venice), 1979

Venice, California 1904-1930 by Jeffrey Stanton, ARS Publications (Venice), 1978

Venice of America: The American Dream Come True by Sweet William, Constitutional Capers (Venice), 1976

Marsden Hartley (p. 122)

Marsden Hartley by Barbara Haskell (exhibition catalog), Whitney Museum of American Art in association with New York University Press, 1980

Marsden Hartley by Elizabeth McCausland, University of Minnesota Press, 1952

Selected Poems by Marsden Hartley, edited by Henry W. Wells, Viking Press, 1945

Georgia O'Keeffe, A Portrait by Alfred Stieglitz, Metropolitan Museum of Art, 1978

"Stieglitz and 291" by William Innes Homer, *Art in America,* July/August 1973

"A Northern Seascape" by Sanford Schwartz, *Art in America,* January/February 1976

Garrett Collection (p. 131)

A Guide Book of United States Coins by R. S. Yeoman, Whitman (Racine, Wisconsin), 32nd ed., 1979

Numismatic Art in America by Cornelius Vermeule, Belknap Press of Harvard University Press, 1971

The History of United States Coinage As Illustrated by the Garrett Collection by Q. David Bowers for The Johns Hopkins University, Bowers & Ruddy Galleries (Los Angeles), 1979

Picture credits

20 Uffizi, Florence/from *Encyclopedia of World Art,* McGraw-Hill Book Company; 28-36 Gloria Kamen; 49 Dan McCoy; 50 Bill Pierce; 51-54 Dan McCoy; 54, 55 Bill Pierce; 55-57 Dan McCoy; 58-67 Dmitri Kessel; 70-73 Michael Parfit; 74-77 Harley F. Hettick; 78, 79 Michael Parfit; 82-88 Tui DeRoy Moore; 92-100 John Huehnergarth; 102 The Newfoundland Museum; 102, 103 Vickers Limited; 104 The Newfoundland Museum, The Newfoundland Museum, from *Newfoundland Air Mails 1919-1939* by R. E. R. Dolwick and C. H. C. Harmer, 1953; 105 National Air and Space Museum; 106, 107 The Newfoundland Museum; 108 Derek Bayes/courtesy Manchester Airport Authority; 109 Derek Bayes/courtesy Royal Air Force Museum, Hendon; 110 Mansell Collection; 111 Derek Bayes; 112-115 Chad Slattery; 116 Thomas Sewell; 117-121 Chad Slattery (and final cover); 122 Whitney Museum of American Art; 123 The National Gallery of Art/courtesy Georgia O'Keeffe; 124-128 The Whitney Museum of American Art; 131-133 Larry Stevens; 134 Charles H. Phillips/courtesy Evergreen House Foundation; 136-143 Larry Stevens; 144 Barbara Pfeffer; 166 Mignon Davis; 168 The Corning Museum of Glass; 170 National Portrait Gallery; 174 Mike Ramus.

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Smithsonian highlights

The new Early Flight gallery at the Air and Space Museum goes all out to transport you back to the days of the great aeronautical exhibitions in the early 1900s by including such wonders as a Lilienthal glider, the Wright 1909 Military Flyer, a Curtiss Headless Pusher. Period furnishings, potted plants, ragtime music and manikins in authentic dress re-create an era of bravado sufficient enough to start you wondering if you would have gone up in one of those things.

An exhibition honoring Joan Miró, 87, opens at the Hirshhorn with 45 major works dating from 1914 to 1974. The selections span a career, from still lifes through surrealistic works to the colorful, biomorphic imagery of the artist's mature style.

Special March events

Hirshhorn Museum & Sculpture Garden
Miró: Selected Paintings (March 20-June 18)—Exhibition features 45 major paintings, 1914-1974.

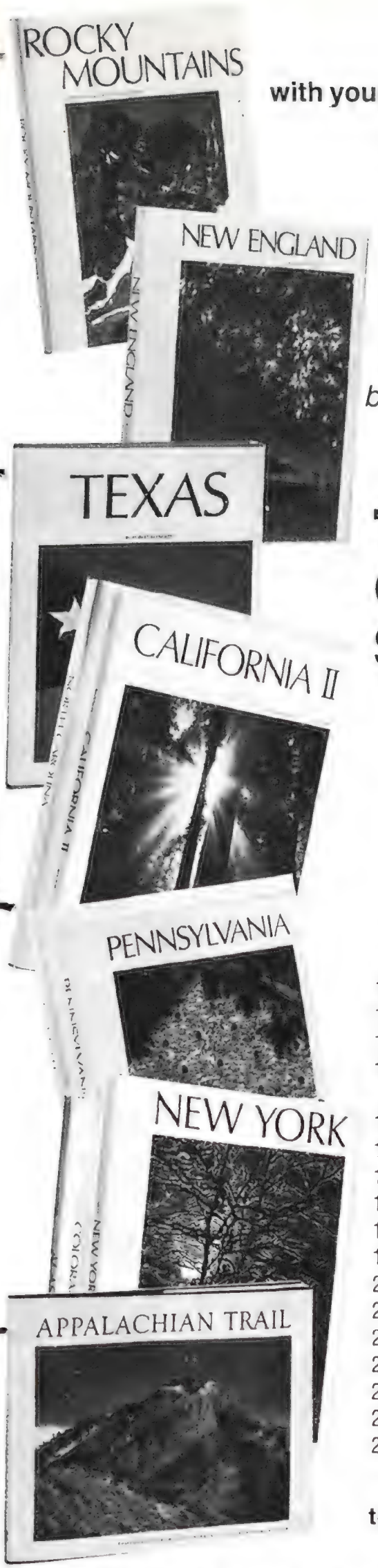
Air and Space Museum
Early Flight—New exhibition gallery recreates era circa 1913.
Women in Aviation (March 20, 7:30 P.M.)—Lectures by four women who have made significant contributions to the field.
Weather on Other Worlds (March 12, 7:30 P.M.)—Lecture by astronomer Conway Leovy.
Sun, Stars and Seasons (March 1, 9 A.M.)—Monthly sky lecture explains equinoxes and solstices.
Space Fiction Film Series (March 7, 14, 21, 28, 7:30 P.M.)

Cooper-Hewitt Museum (New York)
A Century of Ceramics in the United States, 1878-1978 (through May 25).
The Oceanliner: Speed, Style, Symbol (through April 6).
Tiles (through March 30).
Sunday Performances for Young People (March 2, 16, 23, 30, 3 P.M.)—Puppets, mime, dancers, actors and clowns create acts for children ages five to nine.

Museum of Natural History (MNH)
African Insights (March 22-May 18)—Photographs by Mignon Davis feature landscapes, people, fauna (below).
The Precious Metals: Gold and Platinum—New exhibition of spectacular samples.
Lectures—"Those Fascinating Wildflowers" (March 7, noon)—Francis Greenwell, Vertebrate Zoology; "Curators' Visit to China" (March 21, noon), lectures by several museum curators.

Freer Gallery
The Iconography of Islamic Architecture (March 11, 8:30 P.M.)—Lecture by Oleg Grabar, Harvard University.
A Decade of Discovery: Selected Acquisitions 1970-1980 (through April)—Some 100 works span 2,000 years of civilization.
Japanese Prints (through April 1).

MNH's *African Insights* includes photo of katydid in South Africa; hollow abdomen acts as resonator for its characteristic sound.



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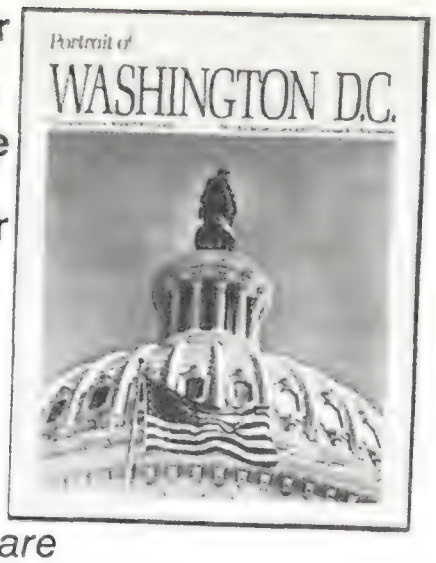

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Renwick Gallery

New Glass (March 21-August 24)—International selection from 196 artists, including sculpture, bowls, goblets, vases (above).

Georg Jensen Silversmithy: 77 Artists, 75 Years (through July 6).

Twills with Titles: H. Theodore Hallman, weaver; Kenneth G. Mills, poet (through April 27)—Textile exhibit.

Museum of History & Technology (MHT)

Saturday Live (Saturdays, 2 P.M.)—New musical series, Musical Instruments Hall.

Free Film Theater (Wednesdays, Thursdays, 12:30 P.M., Carmichael)—March programs focus on Nazi Germany.

National Collection of Fine Arts

Birds: Works from the 1979 Annual Exhibition of Art Depicting Birds (through May 6)—Paintings, woodcarvings.

Recent Acquisitions: Prints, Drawings and Watercolors (through June 22).

The American Renaissance, 1876-1917 (through April 20)—Varied works.

National Portrait Gallery

The Emancipation Proclamation (March 3-February '81)—A look at events prior to 1862 proclamation and its impact on the Civil War (p. 170).

Howard Chandler Christy (through August 3)—Illustrations, portraits.

Radio Smithsonian

This music and conversation program is broadcast weekly on approximately 65 stations across the country. For details, consult your local fine arts radio station. (A different schedule of programs is heard in Washington.)

The "First" Abstract Expressionist—Paintings of Arshile Gorky; *Russia's American Empire*—Saga of Russia's forays into Alaska and as far south as Hawaii (week of March 2).

The Great Crash and Its Art (week of March 9).

And There Was Light!—Celebrating the 100th anniversary of the light bulb; *Buildings for a Capital*—A look at some now-forgotten Washington buildings (week of March 16).

Crafts of Black Americans (week of March 23).

Catlin's Indian Gallery—Life and work of the famous painter; *Doctors in Space*—Medical implications of space adventures (week of March 30).

Smithsonian events

Special events and performances in March are listed below. For tickets, call (A) 202-381-5157 or (B) 202-381-5359, as noted in the listings.

Discover Clowning (February 27-March 30, A&I Discovery Theater, Wednesdays-Sundays)—Comedy for children. (B)

Royal Dancers and Musicians of Bhutan (March 5, 8 P.M., MNH)—Colorful masked dance-drama; free demonstration, March 4, 8 P.M., MNH. (B)

Vienna: Final Years of Empire (March 8, 10 A.M.-5:15 P.M.)—Seminar by Professor Dale Harris, MHT. (A)

Red Norvo (March 9, 6 P.M., MNH)—Concert by famed vibraphonist. (B)

Godzilla, et al.: Japanese Science Fiction on Film (March 9, 16, 23, 30, April 6, 13, 5 P.M., MHT). (A)

Keyboards: 1693-1893 (March 10, 8 P.M., MHT's Hall of Musical Instruments)—Malcolm Bilson on the "Paderewski" Steinway. (B)

Architecture in Context: The Midwest, 1889-1919 (March 13, 8 P.M., MHT)—Lecture by Roger Kennedy, Director of MHT. (A)

The American Renaissance (March 22, 10 A.M.-6 P.M., MHT)—Seminar. (A)

20th-Century Consort (March 24, 8 P.M., MNH)—Concert. (B)

Emulation and Invention (March 24, 31, April 7, 14, 8 P.M., MHT)—Lectures on American history by Brooke Hindle, MHT senior historian. (A)

Cantilena Chamber Players (March 31, 8 P.M., Hirshhorn). (B)

Musical Weekend in May

A Kennedy Center performance by mezzo Dame Janet Baker, followed by a champagne reception, is among the special events planned for the ninth annual Musical Weekend, May 2, 3 and 4.

Sponsored by the Division of Musical Instruments and the steering committee of the Friends of Music at the Smithsonian, the weekend also includes dinner at the Smithsonian castle, performances on special instruments in the Smithsonian collection and a discussion of recent acquisitions and restorations. Also planned is a tour of the River Farm estate once owned by George Washington and a gamelan music and dance concert at the Indonesian Embassy. Dinner at the National Portrait Gallery will precede the all-Telemann concert by the Smithsonian Chamber Players. Sunday breakfast will be in the Arts and Industries Building's 1876 exhibition.

Hotel accommodations for two nights, meals and tickets are included. For information write Musical Weekend, Room 4124, Museum of History & Technology, Washington, D.C. 20560.

Smithsonian Orientation Program

To make the most of limited time at the Smithsonian, adult groups of ten or more can arrange for a special slide-illustrated introduction to exhibits in the Smithsonian's 13 Washington, D.C., museums and the National Zoo.

To schedule an orientation session for your group, write or call the Visitor Information Center, Group Orientation, Smithsonian Institution, Washington, D.C., 20560 (202-381-6263).

Membership benefits when visiting the Smithsonian

The **Associates Reception Desk,** in the castle, is open 10 A.M.-4 P.M. daily for registration and information materials. Ask for time and place of "orientation slide talk," a 30-minute overview of Smithsonian exhibitions.

The **Associates Lounge** in the castle, a quiet place to relax, is open from 10 A.M. to 5:30 P.M. daily.

The Members' Dining Room, **"The Court,"** in the Museum of Natural History, is open Monday-Friday for lunch (11 A.M.-3 P.M.); weekends, breakfast (8:30-11 A.M.), brunch (11 A.M-3 P.M.). Enter via Constitution Avenue for breakfast.

For previsit information, send postcard or phone Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560 (202-381-6264 or TTY 202-381-4448). Allow two weeks for receipt.

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SITES circulates exhibitions to hundreds of cities outside Washington, D.C. To sponsor a show in your community, write to Eileen Harakal, SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some March exhibits:

Auburn, Alabama (March 22-April 20)—*Polish Posters,* Auburn University.

Scottsdale, Arizona (March 22-May 11)—*Reflections: The Child in America,* Scottsdale Center for the Arts.

Chicago (March 8-April 20)—*Sèvres Porcelain,* Art Institute of Chicago.

Louisville (March 22-April 20)—*Buildings Reborn: New Uses, Old Places,* Museum of Natural History and Science.

Shreveport (March 22-May 4)—*Daum: 100 Years of Glass and Crystal,* Norton Art Gallery.

Boston (March 8-April 6)—*Butterflies!* Boston Science Museum.

Columbia, Missouri (March 22-April 20)—*Designs of the Ndebele,* Stephens Art College.

Albany, New York (March 14-April 20)—*Dorothea Lange: Her Collection,* University Gallery, SUNY Albany.

Clinton, New York (March 22-April 20)—*Graphic Works of Odilon Redon,* Hamilton College, Root Art Center.

Rochester (March 7-April 6)—*The Working American,* University of Rochester.

Utica (March 15-April 13)—*Birds of Prey: Paintings by Louis Agassiz Fuertes,* Munson-Williams-Proctor Institute.

Tulsa (March 22-May 4)—*Phillips Collection in the Making: 1920-1930,* Philbrook Art Center.

Loretto, Pennsylvania (March 1-30)—*Art of American Wood Engraving, 1780-1900,* Southern Alleghenies Art Museum.

Memphis (March 22-April 26)—*Jouets Americains, 1925-1975,* Brooks Memorial Art Gallery.

Salem, Virginia (March 15-April 13)—*American Drawings II,* Roanoke College.

Oshkosh (March 15-April 27)—*Patterns and Sources of Navajo Weaving,* Paine Art Center and Arboretum.

Dunwoody, Georgia (March 8-April 6)—*Ride On!* Zaban Branch.

Columbus, Indiana (March 8-April 6)—*Ride On!* Bartholomew County Library.

Las Vegas, Nevada (March 15-April 27)—*Arts of Latin America,* Museum of Natural History.

Youngstown, Ohio (March 10-April 10)—*American Eagle,* Union National Bank.

San Antonio (March 22-April 20)—*Blacks in the Westward Movement,* Carver Community Cultural Center.

Wausau, Wisconsin (March 15-April 13)—*The Great West, Real/Ideal,* Woodson Art Museum.

Cheyenne, Wyoming (March 15-April 13)—*The Seat of American Invention,* Laramie County Library Foundation.

Regional events

A weekend exhibition of masterpieces from the national gem collection will highlight the Regional Events program in San Antonio, March 21-30. The program also includes lectures on Europe's great gardens, America's art collectors and the National Air and Space Museum, as well as folk music performances. Programs are cosponsored by local art, scientific and historical groups. Other cities on the 1980 tour are Des Moines, Grand Rapids, St. Louis, Anchorage, Fairbanks and Honolulu. For information write: Regional Events, 1208 A&I, Smithsonian Institution, Washington, D.C. 20560.

Abraham Lincoln appears in *First Reading of the Emancipation Proclamation,* engraving at National Portrait Gallery.

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Imagine yourself dining on delicious continental cuisine and sleeping in old world splendor in a 15th century castle, enjoying Irish country food and environment at an old farmhouse or the do-it-yourself relaxed atmosphere of a thatched cottage.

When you picture Ireland, think Dublin, the capital city. The city with the National Botanic Gardens, and the recently restored Malahide Castle, and the Abbey Theatre, and Phoenix Park, and the James Joyce Tower.

Picture a festival. For no matter what time of year you come, you're bound to catch one. And whether it's the Dublin Arts Festival, the Killarney Bach Festival or the Castlebar International Song Contest, one thing's for sure: a vacation in Ireland is a picture you'll never forget.

So send for your free booklet, "From Ireland With Love," then call your travel agent.

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Domestic Study Tours

These tours offer specialized guidance and expertise generally unavailable to persons traveling on their own:

Smithsonian Sampler Weekend—March 7-9 or March 21-23: Join curators and staff for behind-the-scenes tours of specially selected museums.

Big Bend—April 26-May 4: Hike the spectacular canyon trails in this southwest Texas wilderness park.

Navajo and Hopi Cultures—May 4-13: Trace the rich tribal history of these Arizona Indians.

History of the Federal City—May 14-18: Discover the origins of our nation's capital, including private house tours and behind-the-scenes visit to the Capitol.

Grand Tetons—June 1-11: An active outdoor program of hikes and field trips to explore the beautiful back country of Grand Teton National Park.

Bryce/Zion—June 3-11: Study the geology and natural history of Utah's spectacular national parks.

Desolation and Gray Canyons—July 22-August 1, September 30-October 11, or October 12-23: White-water trip for the adventurous; explore geology, wildlife and exciting Indian and outlaw history of Utah's Green River.

Collegiate Peaks of Colorado—July 26-August 3: Base camp nestled in alpine basin near Continental Divide provides ideal setting for environmental education.

Alaska—July 31-August 8: The serenity of Mt. McKinley National Park at Camp Denali, a wilderness retreat.

Williamsburg Family Weekend—August 14-17: A repeat of our popular program for children 7-14 (and parents) to learn about 18th-century life through participation in Colonial activities.

Grand Canyon—August 14-24 or August 22-September 1: Exciting raft trip on the Colorado with emphasis on geology and natural history.

Washington "Anytime" Weekend: Choose any weekend to visit your choice of Smithsonian museums, spend two nights at Loew's L'Enfant Plaza Hotel or Hyatt Regency Washington, each close to the Mall, and see other sights in the city by Tourmobile. Reservations and payments at least ten days prior to arrival.

Foreign Study Tours

These tours range in size from small group experiences to charter adventures and vary in price from low cost to deluxe, depending on the type of travel, destination visited and length of trip:

Ancient Civilizations—March 17-April 7: Join noted archaeologists and anthropologists aboard the *Argonaut* for an in-depth study of Egypt, Israel, Jordan and Greece.

Ecuador and the Galápagos Islands—April 19-May 1: Visit Quito, then board the *Buccaneer* for voyage through the Islands.

Springtime in Greece*—May 4-20: A program in Athens and a cruise to Hydra and Aegina, followed by visits to renowned sites of ancient civilizations.

Russia*—May 18-June 1: Enjoy springtime in Leningrad, Tallinn and Moscow with a two-day excursion to Vladimir and Suzdal; see palaces, the Kremlin, the Hermitage among other museums; life-seeing visits to schools, factories and clinics.

London*—May 25-June 8: A full program in London with special lectures, walking tours, theater and excursions; a five-day travel seminar into the English countryside.

The Wild Highlands of Scotland—May 29-June 14: Study natural history and wildlife of the central Highland glens.

Island World of Britain—May 30-June 15: Gain a unique maritime perspective by circumnavigating the British Isles aboard the *Argonaut*, visiting well-known destinations and nine remote outer islands. Lectures and on-shore excursions explore prehistoric ruins and contemporary economic issues, great houses and village hamlets. A private farewell dinner at the Houses of Parliament concludes journey.

Montreal/Quebec—June 14-19: Enjoy the old-world charm of these Canadian cities while learning about their cultural history on walking tours and museum visits.

Iceland: Land of Fire and Ice—August 3-17: Travel a rugged terrain of glaciers, hot springs, fjords and waterfalls. Visit fishing and farming communities to meet today's pioneers of the far North.

Scandinavian Passage: Fjords and Capitals—August 8-23: From Bergen, Norway, cruise magnificent Nordfjord and Sognefjorden. Continue to Copenhagen and Visby, Sweden, then cruise the Baltic, calling in at Leningrad and Tallinn before returning to Stockholm. Learn about Scandinavia through lectures and activities ashore and on board the *World Discoverer*.

Oxford/Smithsonian Seminar—September 14-29: Live in Worcester College and attend lectures and field trips conducted by Oxford staff.

Russian Sampler*—September 15-29: Travel to one of three areas in the Soviet Union: old European Russia, the Baltic republics or Central Asia.

Adriatic Shores—September 19-October 5: From Athens, cruise both shores of the Adriatic Sea aboard the *Argonaut*. In Italy, visit churches, museums, palaces in Brindisi, Bari, Ravenna, Trieste and Venice. Explore walled cities of Dubrovnik and Split on Yugoslavia's Dalmatian coast, and the Greek island of Corfu.

Paris & French Countryside*—September 21-October 5: Museum lectures and day excursions from Paris plus week-long travel to Alsace-Lorraine, Provence, or Normandy and Brittany.

The Land of Eire*—September 28-October 12: Circle tour of the Irish Republic includes in-depth visits to museums, medieval sites, and seminars on Irish history, architecture and folklore.

Kyoto Seminar—October 18-November 1: In this medieval capital, study language, art, history, religion and the development of modern Japan.

Antarctica—December 31, 1980-January 20, 1981: Prominent lecturers make this a rewarding expedition to a powerful continent. Cruise aboard the *World Discoverer* from Punta Arenas, Chile, to the Falkland Islands, then down to Antarctica.

* Indicates optional predeparture course.

Write National Associates, A&I 1278, Smithsonian Institution, Washington, D.C. 20560 for specific tour/seminar brochures or call (202)

in Washington

Selected Studies Seminars

Come enjoy a popular new low-cost program at the Smithsonian combining outstanding speakers and small specially arranged tours "behind-the-scenes." Choose from:

American Antique Furniture—March 16-21: Connoisseurship of masterpieces, 1650-1840. Includes color slides of great collections, detection of fakes, care of antiques and tours of the elegant Diplomatic Reception Rooms of the Department of State and of Winterthur Museum.

China: A Cultural History—March 23-28: Prehistory to the enigmas of today, with emphasis on the intellectual and artistic traditions and the great philosophies and religions. Includes recent films and tours of the Freer Gallery of Art.

Genealogical Research—March 23-28 and June 8-13: Leading authorities teach participants how to conduct research in the National Archives, Library of Congress and DAR Library.

French Impressionist Painting—April 13-18: Includes tours of the masterpieces by Monet, Degas, Renoir and other artists in the collections of the National Gallery of Art and other museums.

A Grand Tour of the Solar System—April 20-25: NASA's leading scientists in planetary exploration share their new knowledge using slides and films made during the most recent missions. Includes activities at Goddard Space Flight Center and the U.S. Naval Observatory.

Historic Horticulture—May 4-9: Celebrate the profusion of spring in the lovely gardens of Mount Vernon, the National Arboretum, Dumbarton Oaks, Hillwood and the du Pont estates of Longwood and Winterthur.

The Arts of Japan—May 18-23: Connoisseurs and renowned art historians offer richly illustrated lectures and tours of the outstanding Freer Gallery of Art; tea ceremony at the Embassy of Japan.

Astronomy of the Ancients—June 15-20: Leading authorities and widely known writers discuss the intriguing discoveries and hot debates of archaeoastronomy, including Stonehenge, the Mayans and Incas.

381-5635 (tours) or (202) 381-6434 (seminars).

Left to right: Garland Dusenberry (age 68), Clarence Rolman (78), Lem Tolley (82), Herb Fanning (78), Charley Walker (69), Lawrence Waggoner (89), "Spook" Harrison (70).

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By A. B. C. Whipple

Head for the 8:07, gents—the suburbs are in good hands

A funny thing happened recently in a Connecticut suburb. A man not only ran for the office of first selectman of Greenwich, but he even came within a few votes of winning. This is an extraordinary occurrence in a town where the incumbent first selectman is a woman, in a state whose governor is a woman and in Fairfield County, which even has a woman as high sheriff.

It came out all right: the man lost. Still, it was such a close call that, before it was over, a recount had to be made. More embarrassing, the official tally turned out to be in error. Two male certified public accountants had tabulated the votes incorrectly, but their mistake was discovered by a woman reporter.

It was in many ways a typical performance, and not in the least surprising to those who understand the nature of Connecticut's political matriarchy. For some years now, especially in Greenwich, a dozen or so formidably capable women have been managing the affairs of the town in the many volunteer agencies and commissions, often cleaning up after managerial mistakes made by men.

To understand the reason for this phenomenon, one need not be a sociologist, though perhaps an appreciation of Darwin's theory of evolution might help. What the voters of this suburb have recognized, rather earlier than in most other communities, is the natural superiority of the suburban woman.

This, of course, is hardly news. The managerial talents of women have been evident since America's earliest days. There were plenty of examples in the American West, but there were also some vivid illustrations of the phenomenon in New England seaport towns, and especially on Nantucket Island, which in the 19th century had one thing in common with modern suburbia—the men were gone a lot.

One of the busiest streets of shops in Nantucket was so dominated by women storekeepers that it was called Petticoat Row. While the men were off chasing whales, the women simply set up their own businesses on the Row, now called Center Street, and ran them with great skill and success. This was the period known as the Golden Age of Nantucket. It was only when the men returned home, in the latter part of the century, that the island went into decline.

One of Nantucket's most competent women was Maria Mitchell, an astronomer who discovered the comet since named after her and who became a professor at Vassar. When a male friend condescendingly asked her how a woman could have the stamina for the long night hours required by astronomy, her reply (possibly apocryphal) was "Sir, my mother had more night work than astronomy will ever demand of any woman. She brought up eight children."

This traditional capability, not always fully appreciated in earlier years, has become more obvious in the modern environment of suburbia, which is not to say that suburban men are utterly incompetent. What has happened is that some three generations of commuting have bred a different subspecies. Suburban man tends to be an excellent golfer, for example. In a partial role reversal, he often is a good cook, though only outdoors. And he exhibits a capacity for enduring hardship which could come only from generations of inbreeding. During his career, a Greenwich commuter may spend as many as two years haunch-to-haunch with his fellow sufferers in a noisome railroad car, trying to get to and from New York City. Over the years this process selects out, as the geneticist would say, an adaptive creature who can patiently sit in a train stalled in a tunnel for hours, reacting only by rattling his *New York Times* or *Wall Street Journal* under conditions that would send Iranians rampaging through the cars.

Yet the experience also seems to breed out, as it were, the ability to deal as crisply and coolly with responsibility as suburban women do. Suburban men in the office of first selectman, in the past, tended to avoid decision making by appointing study committees and by hiring consultants who could be counted on to earn their expensive fees by consuming a great deal of time so that the decision could be put off, sometimes for as much as a decade. Nor do suburban men appear capable of rational, unemotional discussion in difficult situations. A recent instance in Greenwich occurred at the YMCA, whose board of directors got into such a fight that the members had to vote in a new board. That sort of thing would never happen at the YWCA.

The United States as a whole has lagged behind such advanced countries as India, Bolivia and England in recognizing the effectiveness of women in power. But the voters of Greenwich and Connecticut have been in the vanguard of those accepting the natural superiority of women as managers, and have not been misled into voting for a man simply because of his charm and good looks.

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Witness the case of William Moser, a broadcast engineer. Over the years he's bought five Volvos and they're all still in the family. You see, instead of trading in his old Volvo every time he wants a new one, he passes it on to a member of his family. Because he believes his family is better off in a used Volvo than in any new car.

According to Mr. Moser, "Every time I get a new Volvo, my family is as excited about it as I am. After all, they know someday it'll be theirs."

So if you're tired of buying cars you run into the ground in no time, do as Mr. Moser did. Buy a car that could run in the family for years.

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Bill Moser with his new Volvo. And his family with his old ones.

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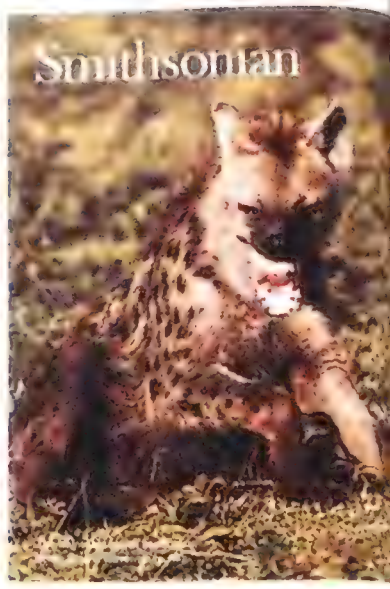

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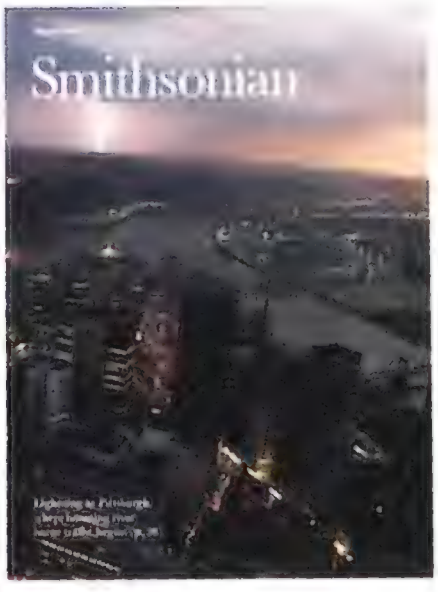

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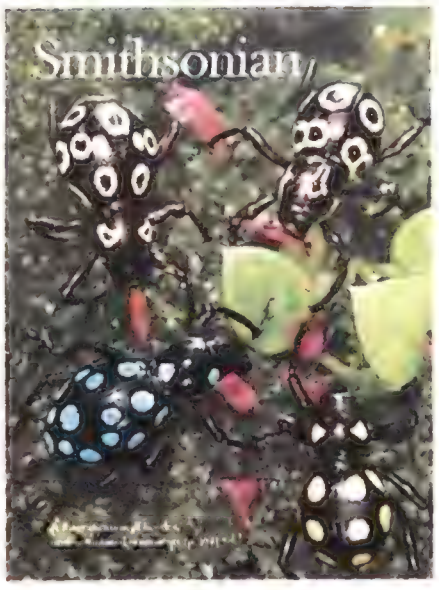

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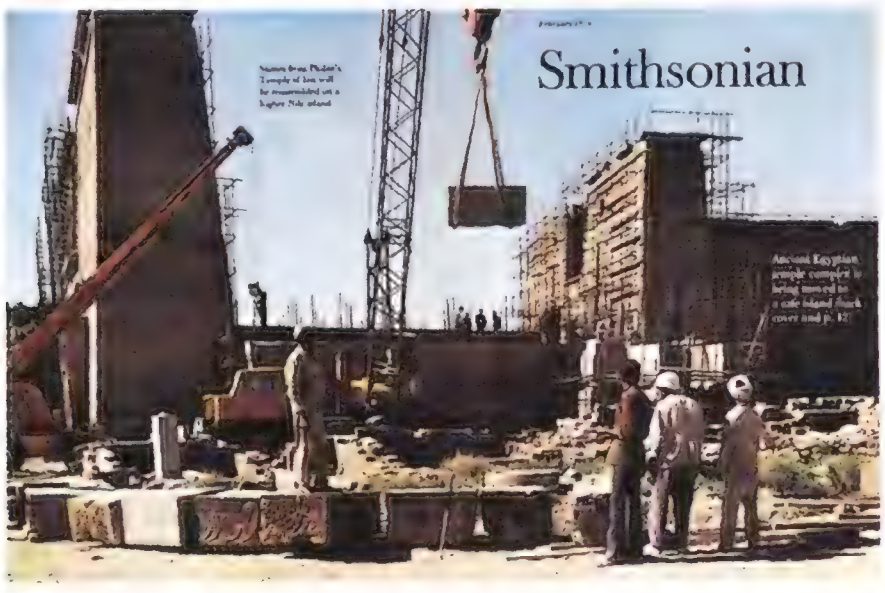

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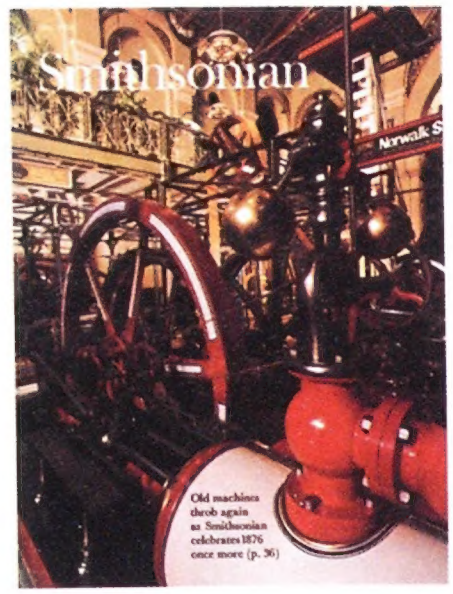

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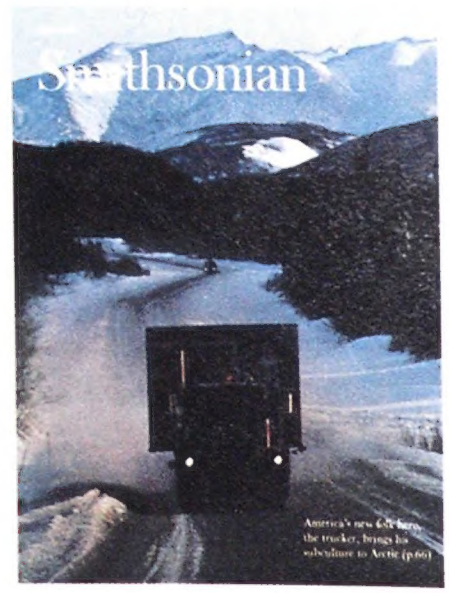

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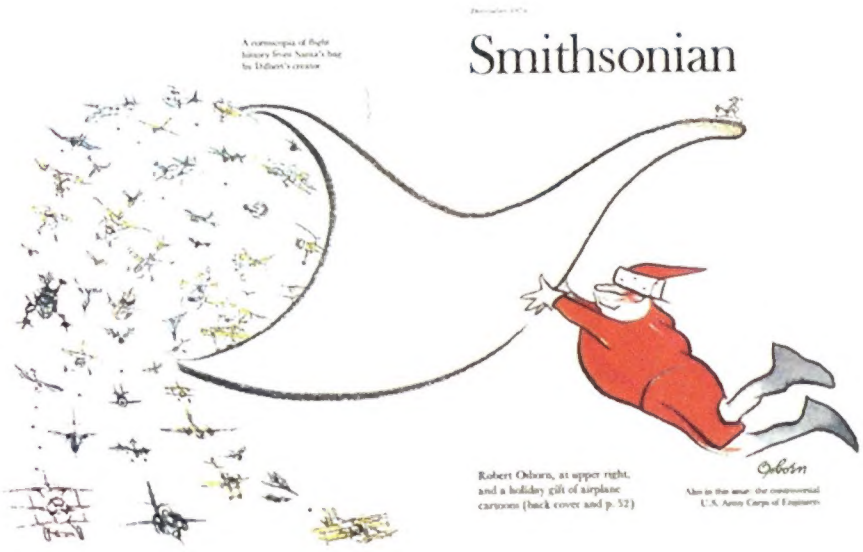

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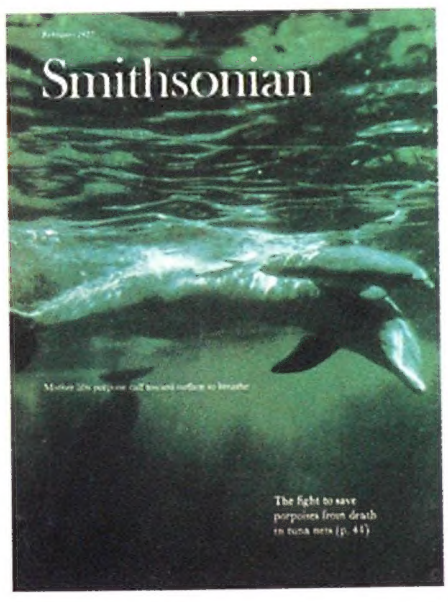

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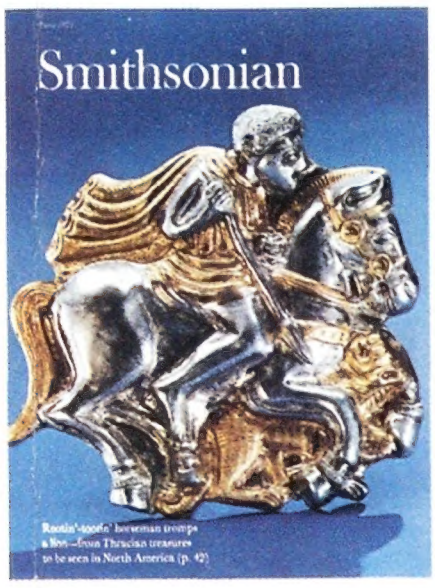

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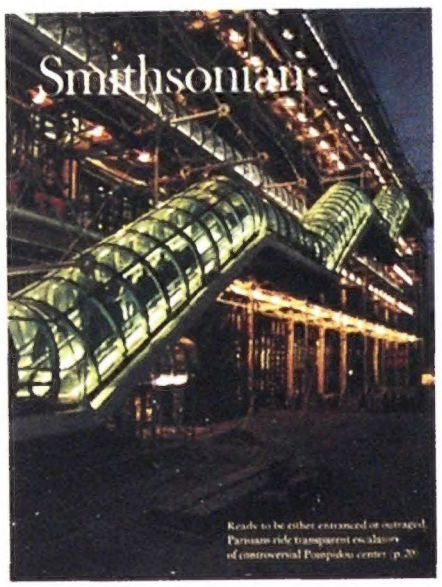

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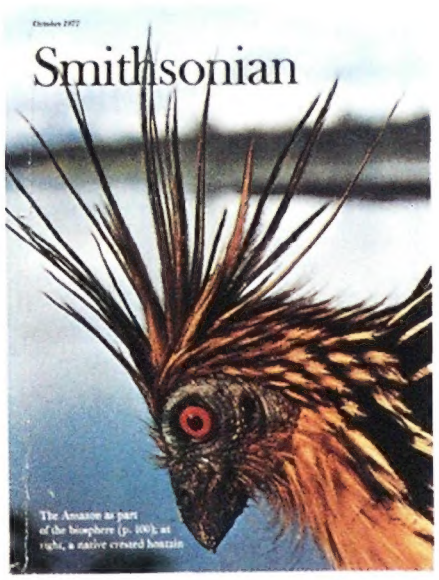

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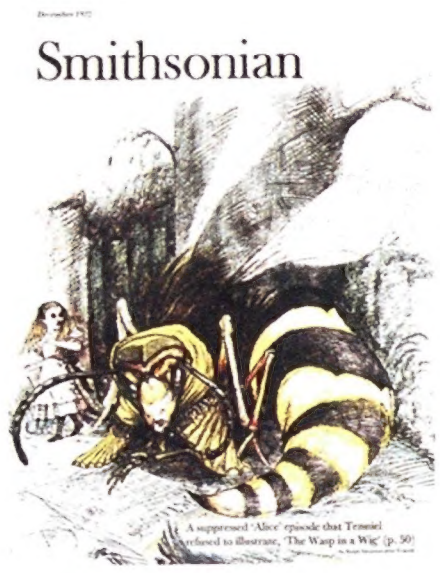

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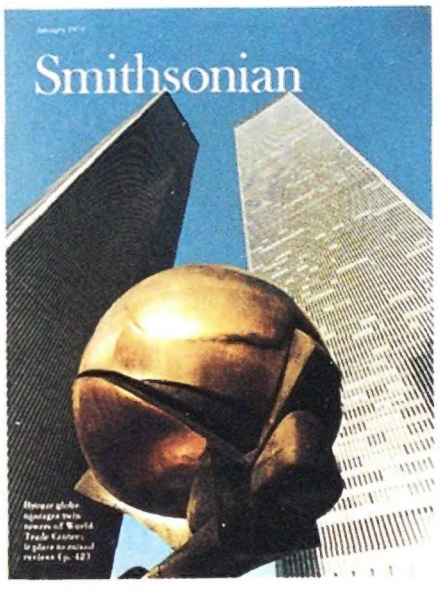

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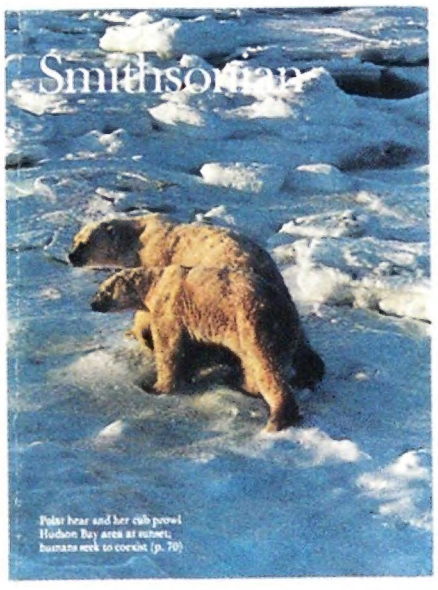

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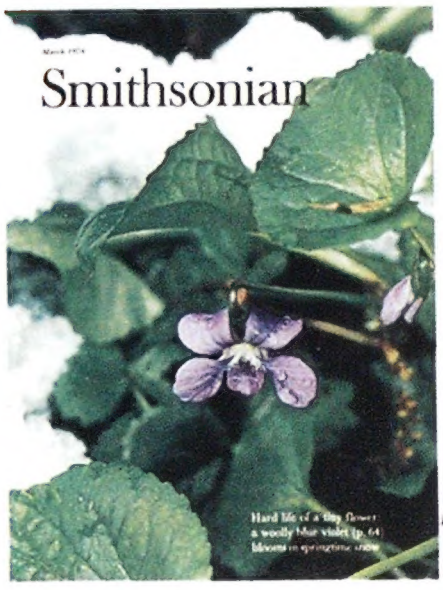

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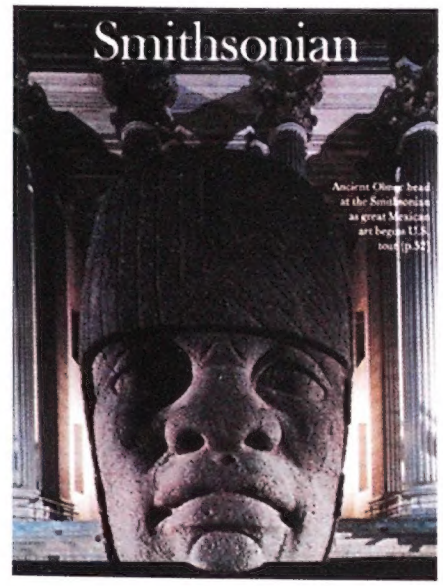

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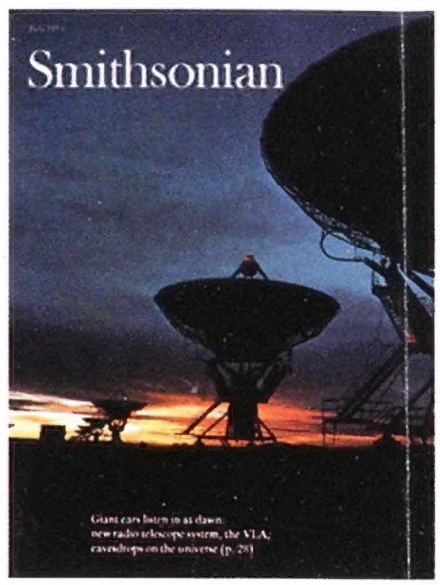

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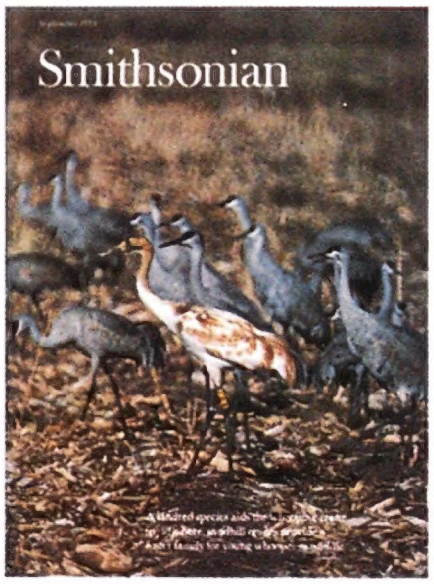

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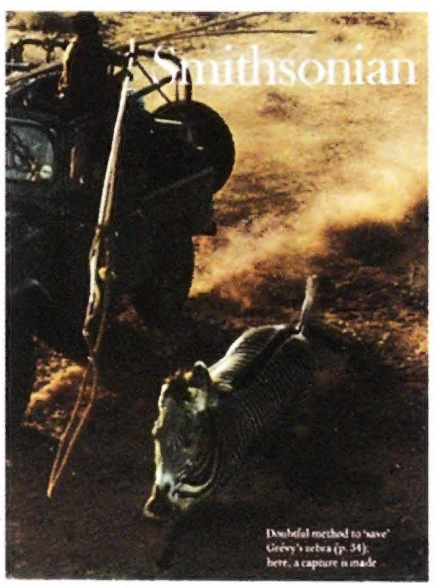

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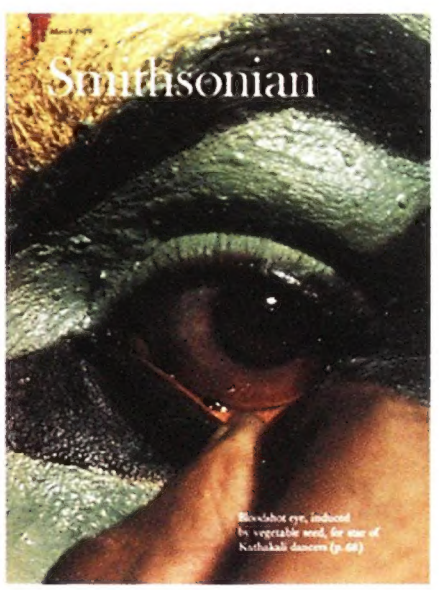

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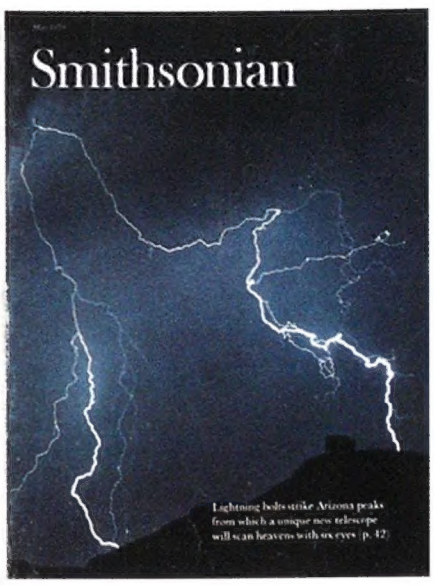
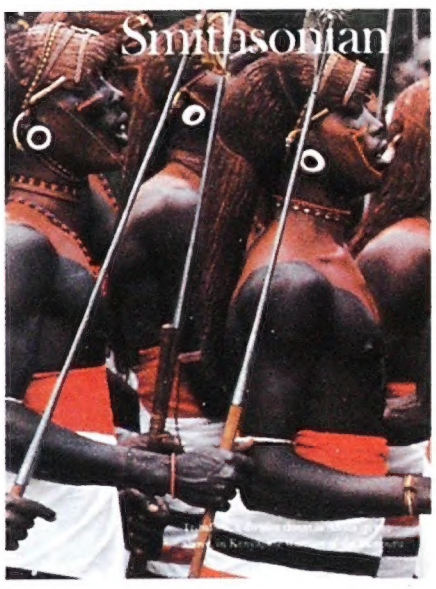

Smithsonian
Lightning bolts strike Arizona peaks from which a unique new telescope will scan heavens with six eyes (p. 42)

May 1979



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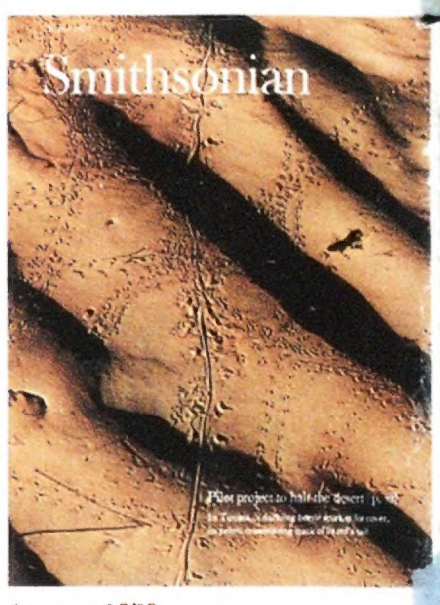

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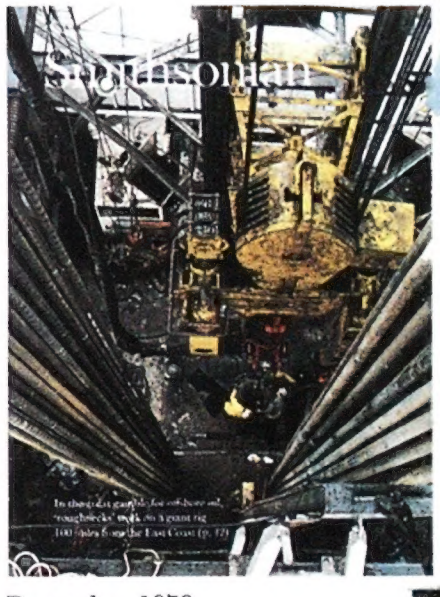

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